

# POPULAR Computing WEEKLY

440 Rock Es

Only 50p.

15-21 May 1986

Vol 5 No 20

## CST rescues QL from the dead

- A QL upgrade and a rescue plan launched at the ZX Microlair
- CST's Thor to be released with a 68020 processor in September

- Full specifications of the Thor and information on the rescue plan

*Full details below and inside*

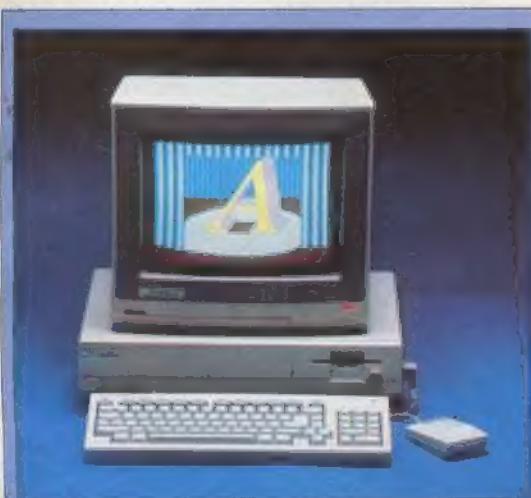
HELP is at hand for the QL, with

at least one, possibly two new machines scheduled for a September launch. The first of the machines, CST's Thor, was previewed at Saturday's ZX Microlair. It is currently an upgrade of the original machine, but CST plans a completely new 68020 processor machine for September.

The single prototype Thor, which the company has at the moment, was completed the day before the Microlair, and is basically a repacked version of CST's QL add-ons fitted into a CPU box with a detachable keyboard. The latter's layout and design is actually that of IBM's AT business computer - streets ahead of the original QL keyboard.

The main system unit houses the QL circuit board, all other parts of the original machine having been thrown away, and additional circuitry from CST to

*continued on page 4 ▶*



*The Amiga launch - p4  
Full Commodore show report - p10*

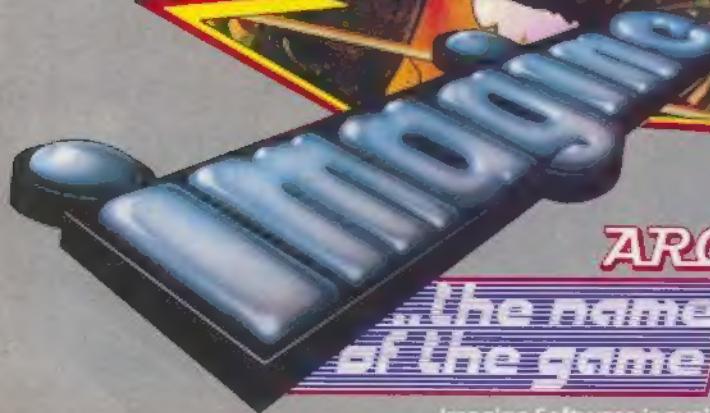
### COLOUR FEATURE



*Review - see p16*

### THIS WEEK'S NEWS

- Amstrad plans 256k Spectrum?
- Redesign for Commodore 64 this year?



Konami.

**ARCADE HOT SHOT**

*The name  
of the game*

SPECTRUM 48K

**£7.95**

SPECTRUM 48K

COMMODORE 64

**£8.95**

AMSTRAD

Imagine Software (1984), 6 Central Street,  
Manchester M2 5NS. Tel: 061 834 3939. Telex: 669977

Imagine Software is available from:

WHSMITH, John Menzies, WOOLWORTH, LASKYS, Rumbelows, Greens, Spectrum Shops and all good dealers.



## ◀ HARDWARE

**12 Centronics GLP2**

The GLP1 was generally well-received - now here's its successor in the dot-matrix printer field. Peter Worlock reports on the improvements made

## ◀ SOFTWARE

**14 Promerge Plus**

Arnor adds mail merge to its Protect word processor on the CPC machines

**Hisoft Pascal**

An inexpensive addition to the Amstrad library of Pascal implementations which will run on the 6128 or 8256

## ◀ GAMES

**16 Price of Magik**

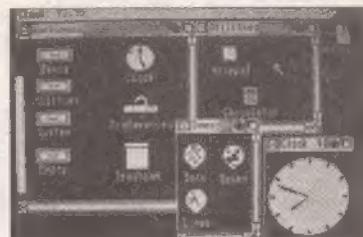
Level 9 is arguably the premier adventure house in the UK - how does its latest, *The Price of Magik*, hold up to the rest of the range. Read our review and ogle the colour pictures

**18 Reviews****20 Adventure Corner****21 Adventure Helpline****22 Arcade Action**

## ◀ SPECIAL FEATURES

**10 Show Report**

All the news from the Commodore computer show. That Amiga launch... and much more



The Amiga in action

**24 Readers' Survey**

Love *Popular*, or hate it? Your chance to tell us exactly what you think of us... and help famine-fighting charity War on Want at the same time



Reviews - see page 18

## ◀ PROGRAMMING

**27 QL**

Lose yourself in our maze program

**28 Commodore 64**

One for engineers: practise your resistor colour codes

**29 Amstrad**

Concluding part of the astronomy program

**30 Spectrum**

The final lap of our marathon machine code utilities series

**32 Atari ST**

A simple paint program for your monochrome ST

**33 Bytes & Pieces****36 Peek and Poke**

## ◀ REGULARS

**4, 5, 6 News Desk**

Commodore revamps its 8-bit machines

**7 Letters, Puzzle**

Special symbols on the PCW8256

**35 Communications**

David Wallin discusses a simple way to become a Bulletin Board sysop - with Communitele

**44 New Releases****46 Charts**

**Editor** Christina Erkine **News editor** John Lettice **Features editor** Graham Taylor **Software editor** John Cook **Production editor** Lynne Constable **Supplements editor** Christopher Jenkins **Supplements designer** Barbora Hajek **Promotions manager** Simon Langston **Advertisement manager** Tom Watson **Advertisement executive** David Oseen **Classified executive** Jon Beales **Editorial secretary** Annmarie O'Dwyer **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland

Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 298275 **Typeset** by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. **Printed** by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. **Distributed** by S M Distribution, London SW9. Tel 01-274 8611, Telex 261643.

© Sunshine Publications Ltd 1986.

**Popular Computing Weekly. Tel: 01-437 4343.**

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here - so please do not be tempted. We cannot guarantee to return your programs - so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.



# Commodore reveals its UK Amiga prices

COMMODORE finally unveiled exact prices and packaging on the Amiga computer, at its official UK launch last week.

Commodore UK's acting general manager Chris Kaday revealed, "The Amiga will come in two versions, one at £1,475 plus VAT, the second at £1,675 plus VAT".

The lower priced package, whose final retail price will be £1,696.25, comprises the computer, with 512K Ram, a 3½ inch disc drive, colour monitor, mouse, and start-up software packages. The more expensive version (RRP - £1,926.25) also has a second external 3½ inch drive.

The Amiga is expected to be available through specialist dealers from next month onwards. Commodore is taking orders now.

Kaday said that apart from general business outlets, the



**Kaday: two versions of Amiga**  
company also hoped to sell the Amiga to educational establishments, for Cad/Cam applications, graphics/animation development, eg, in advertising agencies, and for musical and desk-top publishing projects. Nor did he discount the (very rich) home user.

Additional products sold with the Amiga include the external disc drive as a sepa-

rate package, for £249 (ex-VAT, £286.35 inclusive), and external 5½ inch disc drive at £299 (£343.85 inclusive of VAT), and Sidecar, a hardware IBM emulation package, which contains an Amiga interface and 8088 processor, enabling IBM programs to be run on the Amiga at full speed.

There is also a software IBM emulator, Transformer, which will be cheaper but not as compatible.

Sidecar also boasts 256K Ram expandable to 512K, three IBM compatible I/O expansion slots. It plugs into the Amiga expansion bus.

Kaday said Sidecar would be available in this country "before the end of the year".

*For details of Amiga software and availability see this week's Commodore show report on page III.*

## Software houses hold back on Spectrum 128

PROGRAM development for the 128K Spectrum has come to a virtual standstill, as companies unsure of the machine's future put their projects back.

Firebird is continuing with the rewrite of *Elite*, and has released an extended version of *Rasputin*, but doesn't intend to produce any more specifically 128 titles until it becomes clear there's a reasonable market. Alan Giles of Melbourne House revealed that the 128 version of *Rock 'n' Wrestle* has been abandoned while development of the extended version of *Lord of the Rings* has been "put on hold."

Ocean, two of whose games were bundled with the 128 as sold by Sinclair is also easing up on development, although it still intends to bring out a number of products in the future.

Hewson, which produced a version of *Technician Ted* for the 128's launch, is according to Andrew Hewson adopting a "wait and see attitude."

It's therefore looking very much as if, although 182 compatible 48K games will be available, there will be little specifically 128 software on sale until at least Christmas.

## Amstrad plans 256K Spectrum?

THE new version of the Spectrum, which Amstrad plans to bring out this autumn, may now be rather different than first thought.

It now looks as though Amstrad will not only increase the memory of the Spectrum to 256K, but also utilise Astron cards, credit-card style cartridges with their own part on the machine.

These are currently produced in the UK by Electric Software which had been in negotiations with Sinclair over Astron cards for the Pandora portable project. Pandora has apparently been dropped by Amstrad, but the credit-card implementation has been transferred to the new Spectrum.

It is thought Amstrad plans to bring the machine out at under £200, as a sophisticated games console.

# CST saves the QL from the dead

◀ continued from page 1

control four Rom slots, a mouse port and a parallel port. The machine also has 640K Ram, enhanced QDOS and space for two disc drives. It will be sold with at least one 720K 3½ inch floppy drive, and the other slot will take either a second floppy or CST's £1,000 20Mb Winchester drive, which was also launched at the show.

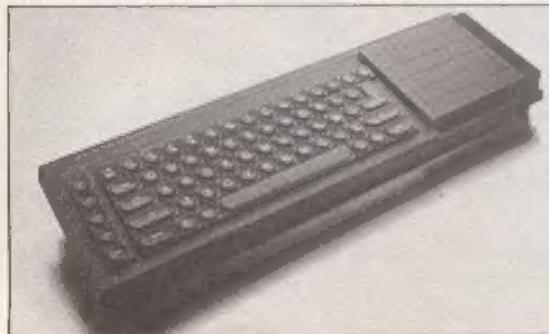
The Thor will initially be sold as an upgrade, although CST is trying to obtain stocks of QLs so that complete systems can be assembled. No price has been fixed yet, but as the components for the base system retail for around £600, it's likely to be over this mark.

The second QL will be from Care Electronics and while

CST intends to leap-frog straight to the full 32-bit 68020 processor, Care hopes to sell a 68000-based machine with single disc drive for £499. According to Tony Tebby of Care, this is the QL rescue plan, and involves a new company being set up with funding from QL dealers. He says if he can get a commitment from dealers to take 50 machines each in the first month it will be possible to raise the £250,000 needed. He claims to be half-way to this total already.

The machine itself, he says, will be fully QL compatible rather than being a QL mark two. This means that the project can go ahead without the active co-operation of Amstrad.

Amstrad's attitude to the two rescue plans isn't yet clear, but as the company is thought to be preparing its own 68000 machine it may not be favourable.



QL: Back from the dead?

# Memotech and Tatung to launch micros

TATUNG and Memotech are both launching machines against Amstrad in the next few months. Tatung's follow up to the Einstein is to be launched towards the end of the Summer at a price which is "competitive with Amstrad", according to Tatung spokesman David Bell.

The new machine, which is currently out with software developers, has 3 inch disc drive, 256K Ram, stereo sound output and can display up to 512 colours on screen at the same time. It is, according to Bell, compatible with the previous Tatung machine and will run with Syntaxsoft's Spectrum emulator for the Tatung.

The configuration of Memotech's new machine is less certain. The company is currently in receivership, but is maintaining hardware and software helpline support. The software helpline is being handled by Syntaxsoft whose boss, Keith Hook, also runs Genpat, the Memotech user group, while a spokesman on the hardware support line told

*Popular Computing Weekly* that Memotech was regrouping as a new company under Jeff Boyd, one of the founders of the original company (see *Popular Computing Weekly*, March 27).

Neither Boyd nor Hook was available as PCW went to press, but as the latter has been a software adviser to Memotech for some time it seems likely that Syntaxsoft will be heavily involved in the new machine, and that it will be Z80-based, this being Syntaxsoft's area of specialisation.

Memotech and Tatung are both likely to be attracted by the Amstrad market as their machines are based on the same Z80 processor as Amstrad's micros, and the capabilities of the machines are similar.

If the two companies can cash in on the revival of the CP/M operating system they stand some chance of creaming off some of Amstrad's small business sales.



Tatung's original Einstein micro.

## Timex to ship Sinclair machines into Poland

THE CONFUSION over the ownership of the various constituent parts of Sinclair Research has taken a turn for the worse, with the news that Timex has signed a deal to supply its Spectrum-derived Timex 2068 to Polish schools.

It has further been suggested that Timex secured the eastern European rights to Sinclair

products from Sinclair prior to the Amstrad takeover, despite the fact that Alan Sugar claimed he had secured "worldwide rights" to Sinclair machines at that time.

The Timex 2068 is a variant of the Spectrum first launched in the US, but subsequently withdrawn. It has since been sold in Portugal, where Timex retains rights to the machine. Timex won't comment on the Polish deal, but a statement is expected in the next few days.

## Commodore alters prices and plans a new look for the 64

SEVERAL changes have been made to pricing and packaging policy on Commodore's 8-bit range, reflecting to some extent, the implications of the Amstrad/Sinclair deal for Commodore UK.

While the Commodore 128 was intended at its launch to supersede the aging 64 model in time, it now looks likely that Commodore is considering a relaunch of the 64 in the home market entertainment field.

A redesign of the machine's casing, to bring it more up to date, and more in line with the low-slung keyboards and cream coloured units of the other machines in Commodore's range is also on the cards.

A redesign of the 64 was first mooted at the PCW show last September, but the idea seemed to fade away as Commodore heavily promoted the 64 in the musical application field.

However, Chris Kaday at Commodore UK acknowledged that the Amstrad/Sinclair deal had given Amstrad a virtual monopoly of the current and future entertainment micro market in Britain, aside from Commodore, and that such a relaunch was a possibility.

Some rethinking has also been done on the two 128 machines. The direct 64 upgrade, the Commodore 128, is now available in a compendium pack, similar to that of the 64,

for £269.

The 128D, with a built-in 3½ inch disc drive, will now be available in three versions: the CPU plus drive for £499, the CPU, drive and monochrome monitor at £599, and the latter package, plus printer and Microclerk business software for £999.

Kaday denied however, that this third package was intended to compete with Amstrad's PCW machines. "We are aware of the significant penetration of the PCW's, but this is different – we aim to provide a credible alternative."

The 128D pack has a better quality printer, it's a different machine, with different software, at a different price."

## Amstrad denies disc shortages

AMSTRAD is set to circulate a letter to dealers, saying that the reports of shortages of its 3 inch discs are "myths".

Amstrad's computers are virtually the only ones to use 3 inch discs, and their scarcity has been a problem for any Amstrad disc drive owner.

Now Amstrad has asked its disc supplier Matsushita of Japan for written confirmation of the disc's availability which can be referred to the trade.

Matsushita's letter, however, is expected to include the clause that it will continue to produce the 3 inch discs only as long as Amstrad requires them.



## Miracle Technology's Multimodem for the 64 gets BART approval

Miracle Technology's 64 Multimodem for the Commodore 64 and 128 has now received BART approval. The modem has its own software on ROM, provides CCITT V21/V23 and Bell standards, and handles baud rates of 300/300, 1200/75 and 75/1200. It features auto-dial and auto-answer, and functions include save and print frame. It costs £116.15.

Details from Miracle Technology, St Peters Street, Ipswich IP1 1XB (0473 216141).

## Ocean adds touch of Genius to Laser range

OCEAN'S utility software division, Ocean IQ, has released versions of its *Laser Genius* machine code system for Spectrum, Amstrad and Commo-

dore 64/128. A Spectrum 128 version is to be released shortly.

Laser Genius is a development program written by Oasis Software, which produced *White Lightning* and Ocean IQ's range of compilers and assemblers. It consists of an editor, assembler, monitor and analyser, the latter being a software emulation of some of the functions of hardware-based debugging devices.

The program costs £14.95 for tape, and £19.95 for Commodore and Amstrad disc.

## Mastertronic to sell cheap C128 games

MASTERTRONIC is releasing a range of £4.99 disc-based games software for the Commodore 128. The first titles are both enhanced versions of earlier Mastertronic hits on the 64 - *The Last V8* and *Kick Start*.

The two are among the first specifically 128 titles to be released in this country, and the low price will make them particularly attractive to users. Mastertronic spokeswoman Alison Beasley promises more

128 titles in the near future.

Mastertronic has in the last few months proved that a market for minority machines, such as the C16 and Plus 4, exists. The C128 market is therefore a logical extension to this.

## Kuma launches utility pack for the Amiga

KUMA Computers has released *K-SEKA*, an Editor/Assembler/Debugger for the Amiga. The product is a fast, efficient 68000 assembly code system which includes an Editor, Disassembler, Linker and Machine Code Monitor and operates under Amiga DOS.

*K-SEKA* is currently available at a retail price of £79.95.

Details from Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks. (07357 4335).

## DS Enterprises 01-671 0209

### Disk

5.25"	DS DD	£12.50
Diskpress (Recommended)	DS DD	£12.50
3.5"	DS DD	£28.50
Fuji	DS DD	£29.50
Maxell	DS DD	£29.50

All disks are guaranteed and come packed in plastic flip and file type boxes.

### Drives

QL, Spectrum or BBC Compatible	Single 80 Track	£110.00
3.5"	Dual 80 Track	£199.95

### QL Software

Lattice C	£85.00
Pascal [Full ISO]	£79.00
Super Charger [Basic Compiler]	£40.50
Ram Disc [Ram Disk & Utilities]	£14.95
Tasprint	£17.50
Qlprint	£21.95
Toolkit II [Eeprom version]	£32.95
Ice & Choice	£34.95
Sign Designer [Designs Screens & Signs]	£16.95
Touch Typist	£11.50

### Add Ons

512k Expanderam [Miracle Systems]	£120.00
Including Ram Disk	£127.50
Dual 3.5" Drive & Interface	£265.00
Citizen 120D Printer	£225.00
Centronics GLP	£159.95
Saga 3 Keyboard	£64.95

DS ENTERPRISES, 25 Trinity Rise, London SW2 2QP  
All prices include VAT and Post & Packing

PD925

## FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.

Our computer repair workshop has been an OFFICIAL Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.

Send your faulty computer DIRECT

SPECTRUM	£18.75 inc parts
ZX81	£11.50 inc parts
16K RAM	£9.95 inc parts
MICRODRIVE	£15.95 inc parts
INTERFACE 1-11	£18.75 inc parts

CALL OR SEND WITH CHEQUE OR P.O.

**T.V. SERVICES  
OF CAMBRIDGE LTD  
FRENCH'S ROAD  
CAMBRIDGE CB4 3NP  
Tel: 0223 311371**

187V



## Letters

continued from page 7

your opponents fall into the water; and in the third part, repeated slashing for the first two, and slash-dodge for the second two (including the grand master) got me through easily.

"Well done" it says. I then expected to go back to the start with more, harder opponents to beat. But no - that, as they, is your lot.

Infuriated is not the word for it. I have just spent £10 on a game which I'll probably never want to play again as I can whizz through it in no time.

I'm not an ace games player, so if your readers want a game that will keep them occupied for a long time, they shouldn't buy *The Way of the Tiger*.

The Doppel-ganger  
Barnsley  
Yorkshire

What's a Crash Smash?

### Amstrad disc blues

I'm an Amstrad 464 owner who, in my innocence, recently bought a 3" disc drive, thinking to put my large but



*"We've waited so long it's become a legend before its own lifetime."*

original software collection on to it.

I now find that because of illegal filenames, headerless loaders and that nasty turbo that this was a pipe dream.

I can get some on 3" disc but not all will run, and of those that run, not all do so properly. This does not endear me to our 'struggling' software firms.

I now no longer purchase any software unless I can be assured that it will transfer,

and I can see no point in buying disc software unless it uses all of the disc. After all I can't see anybody putting a five minute program on a C60 cassette - can you?

The practice of producing anti-disc software will not damage the tape pirates but merely produce a new enemy out of the needs of the disc user. Roll on the Amstrad Interface 3.

T Meredith  
BFPO 20

Most software companies will upgrade cassette software to disc for a small fee. In any event, it's not as though you can no longer use your cassette-based programs.

### String driven thing

I read Martin Lanni's letter in *Peek & Poke* (Vol 5 No 18). Your resident expert's answer was fair enough, but...

I had the same type of problem a while ago and it transpired that I was not making allowances for the machine's inability to send a null string. The message I got was the same, "String Too Long".

I now translate null strings to

another character (something like the hash symbol) when sending, and back again on receiving. I have also noticed that the Commodore 64 is particular about the secondary address on file numbers.

Richard Hardaker  
Cobham  
Surrey

A fair point - one of the reasons why professional software uses default settings to such a great extent is to avoid this kind of problem. Instead of doing the translating at the input/output stages, you can predefine all strings to a default character and simply overwrite them as necessary.

# ZX! BASIC v2

POPULAR  
*Computing*  
WEEKLY

## A powerful machine code extension of Spectrum BASIC is free when you subscribe to Popular Computing Weekly.

Take out an annual subscription to Popular Computing Weekly at £19.95 U.K. (£37.40 overseas) and receive, free of charge, the ZX! BASIC v2 tape. The program provides 28 extra commands including sprite handling, collision detection and drawing routines - plus a comprehensive sprite designer.

Complete and return the form below for your free extended BASIC.

Please enter my annual subscription to Popular Computing Weekly at £19.95 U.K. (£37.40 overseas), and send my free ZX! BASIC v2 tape.

I enclose a cheque made payable to Sunshine Publications Ltd.

Please charge my Visa/Access card

No:

Expiry Date:

Name:  Address:

Which computer do you use?

Return this form together with your payment to: PCW Subs., 12/13 Little Newport St., London WC2H 7PP (Please allow 21 days for delivery).

# DO YOU WANT TO BE A HERO?

# Biggles

The result of unique co-operation between three ace software developers and the Biggles film production company, Biggles - The Untold Story will knock you right out of the air! It's a multi-part arcade strategy game in which each part must be completed to reach your final goal.

In the air, on the rooftops, on the ground, or in the trenches

**YOU CAN BE A HERO!**

**Coming in May**

Commodore 64  
Spectrum 48K

£9.95 tape, £12.95 disk  
£9.95 tape

**Coming in June**

Amstrad CPC

£9.95 tape, £14.95 disk

**MIRRORSOFT**

Purnell Book Centre, Paulton, Bristol BS18 5LQ

# Amiga stars at Commodore show

Christina Erskine tours the show where the Amiga was finally let loose, and finds that Commodore's 8-bit machines have not been forgotten

The Amiga, its launch, its continuous demonstrations courtesy of Commodore, and its price, entirely dominated the Seventh Official Commodore Computer Show, held at London's Novotel from May 9-11.

The fact that Commodore publicly showed the Amiga for the first time in the UK at the *Which Computer?* show in January has apparently now been forgotten ("That was a preview," say Commodore executives), and the show last week was being treated as its official launch.

This is curious. The Commodore show has in recent years been attended by entertainment companies and the general public, largely because Commodore's best-selling machines have been aimed in this region too. I suspect that many of the large crowds surrounding the Amiga demonstrations could only goggle and consider their Barclaycard credit limits ruefully.

For the Amiga, its graphics/art, sound and speech abilities notwithstanding, is being directed first and foremost at the business user, be it a purely desk-top user, ad agency or graphic design house user. Home users, in all honesty, will either have to wait for price cuts (which could take some time), or Amiga 'clones' from other companies.

But I may be wrong. Certainly, the Amiga attracted huge interest at the show. Commodore ran continuous demos on its own stand, which congested the upper floor more than somewhat, and also in the Commodore Theatre on the ground floor. It is also important to look at what the Amiga can do, and what the third party software companies intend to put on it, because the capabilities of Amiga encapsulate the way that the home computer market is moving. Every hardware company would like to be able to produce a machine with the Amiga's features at a price everyone can afford, and it won't be that long before one of them does it.

### The Amiga

For a few lucky people, an Amiga could be theirs within a couple of weeks. Commodore was taking orders at the show, and an initial shipment of 1,000 machines is in Britain now. More should be arriving next month, and Commodore is blaming a dock strike for any delays that occur.

Anyway, plenty of Amigas were in evidence at the show on a number of stands – what of the software to run on them?

The Amiga village took up much of the upper floor, and housed twelve companies showing their wares. Its graphics features were being shown off to good effect by



The Amiga – star of the show

Ariolasoft, which demonstrated its *Deluxe Paint*, *Deluxe Video* and *Deluxe Print* packages, licensed from US company Electronic Arts. *Deluxe Paint* is the sort of art creation program which makes any other look rather ill for its sheer speed, flexibility and features available. *Deluxe Video* enables you to create animated graphic sequences, with sound effects and sub-titles, all from a series of not over-complicated menus, while *Print* is a rather jolly little program which will make Christmas cards, calendars, personalised notepaper, etc.

On a more business-like note, Eidersoft's Amiga village stand showed an integrated accounting package, inclusive of nominal ledger, cash book, budget control, sales orders, sales analysis, purchase orders, sales ledger, purchase ledger, inventory control applications, to name but some. Interlex introduced *The Office System*, comprising six modules, each at £49.95: *Office* (environmental manager), *Office Word* (simple word processor), *Office Chat* (electronic mail), *Office Data* (database), *Office Monitor* (analysis of Data), *Office Net* (networking).

Precision has also joined the exclusive band working on Amiga titles: it was showing a variety of titles, including *Aegis Images*, *Aegis Impact*, and *Aegis Animator* (paint, slide presentation and animation

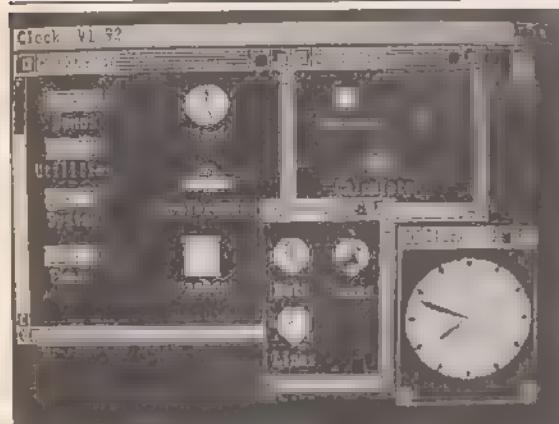
packages), *Logistix* (a spreadsheet, database and business graphics compilation). Precision was also displaying hardware for the Amiga, and was one of the few stands to do so. Its range included a seven-slot expansion box system, and expandable Ram board with 2M memory, and a stereo sound digitiser.

Precision also had an ink-jet printer on display, the Canon PJ-1080A, compatible with the Amiga, 64 and 128, and quite reasonably priced at £299.

Other hardware on show for the Amiga included another 2M Ram expansion, the AX2000, from Canadian company Comspec Communications. Plus, of course, Commodore's own external drives, the additional 3½ inch, and 5½ inch version.

On the languages side, Melacomo announced its Pascal had earned an ISO certificate from the BSI, thus endorsing it as a full, standard Pascal implementation. Micro APL introduced its APL.68000 for the machine.

Not all was deadly serious on the Amiga. In the village, Enigma Developments demonstrated *Trivia Trove*, a series of strategic puzzles – the sort you need to be able to solve in three seconds flat to get into Mensa. Enigma evidently thinks the Amiga is a no-holds-barred home micro: "a game



Windows and multi-tasking on the Amiga

for the whole family", it insists in its press hand-out.

Elsewhere, Mirrorsoft was proudly displaying its astronomy program, *The Halley Project*, licensed from Mindscape in the States, while the Amiga version of that much-publicised venetian blind simulation, *The Pawn*, was demonstrated on the ground floor.

The Amiga village certainly showed that the Amiga will not be completely starved of software, however, space around the village stands was so limited, it was a lucky person who managed to get close enough to see the goods on display.

## Commodore 64/128 – serious software

The 64/128 computers were not forgotten in all the attention being devoted to the Amiga. There was plenty of serious stuff about, notably from Viza Software, Gemini Marketing and Supersoft.

Viza showed its word processor, *Vizawrite Classic*, for the C128, which includes a 30,000 word spell checker, plus its spreadsheet/database/business graphics package, *Vizastar* – all integrated. Gemini showed *Office Mate* (word processor, database, accounts and mailing list) and *Office Master* (the same, plus further accounts modules).

Supersoft, which has been producing Commodore software since before most of us can remember, had a whole new range for the 64 and 128, including a Z80 cross assembler, Turbo disc, and advanced machine code monitor (128 only).

*Microclerk*, the business package bundled with the "business system version" of the 128D (see news story) was being shown as a stand-alone product on JCL's stand. *Microclerk* comprises accounts designed for the small business user, word processor with mail merge, filing, calculator program, and costs £39.99 in its stand-alone configuration.

Also on the non-games area, but more leisure orientated, Wigmore House showed its acclaimed Wigmore mouse

package and software. Trojan displayed *Cadmaster* to be used with its light pen, while for communications enthusiasts, rivals Micronet and Compunet fought it out on near-adjacent stands on the upper floor.

An interesting slant in the communications area, was the appearance of British Rail, which took a stand in exhibit how you can book and buy rail tickets through Prestel and credit

cards. The British Rail representative explained that appearing at shows was a new policy, but that it hopes to make its presence felt in a number of micro exhibitions this year.

## Music

The heavy promotion of the Commodore 64 in this area has led to a variety of products being introduced, to take advantage of the yet-to-be-surpassed-for-the-price SID chip.

Most conspicuous was Music Sales, showing its full Commodore UK-endorsed range, the Music Maker, Sound Studio and the new Sound Expander (see *Popular Computing Weekly*, February 13 for a review). These products are available in one complete package for £149.99. Music Sales' Sound Sampler (£69.99) was also being shown.

Third party musical offerings came from Supersoft, with a C64 drum machine cartridge and software called *Rhythm King*.

(£39.95), and *Microvox*, a digital sound sampler (£299.95, cartridge plus hardware), which has features such as harmonising, phasing and flanging.

## Games

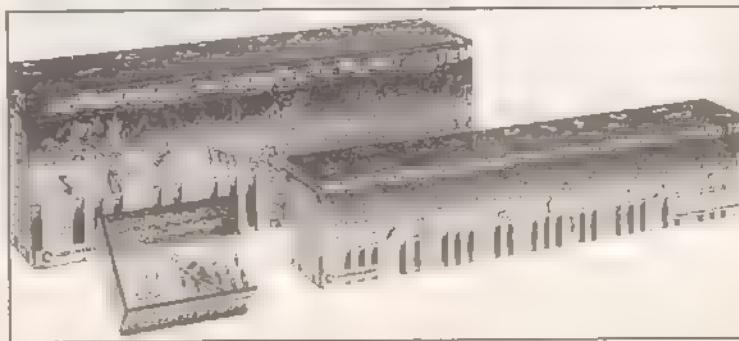
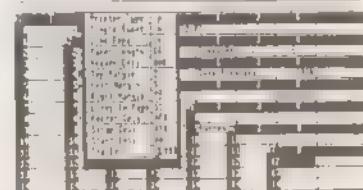
Most of the show faithful were there: Anco (Anirog), Level 9, Mirrorsoft, Llamasoft and Bubble Bus. C16 owners could find plenty of software on the Anco (*Winter Events* in particular). Typesoft Martech showed *Zoids* and *Samatha Fox Strip Poker* on the 64, Level 9 displayed *The Price of Magik* (see elsewhere in this issue); Mirrorsoft showed *Biggles – the Computer Game* for the first time in public, while Jell Minter's Llamasoft was mainly concerned with *Batalyx* and other recent 64 releases.

Robtek showed its much sought after *Game Killer*, and was offering special show prices on that and *Turbo* for the 64.

There were plenty of bargains to be had for anyone looking to expand their C16/C64 catalogue, as a number of wholesalers/retail outlets exhibited at the show.



Above: Aegis Images (Amiga), below: Vizastar (128), bottom: Music Sales complete system (64/128)



# A flawless performance

Peter Worlock looks at the latest dot-matrix printer from Centronics

**A**nyone looking for a general purpose printer is faced with a bewildering range to choose from. Extending the range even further is a new printer from Japanese manufacturer Centronics, being marketed here by Saga Systems.

The GLP II is a dot-matrix model using a nine-pin print head which means it features true descenders and the ability to print good quality graphics and screen dumps.

What makes the GLP II stand out in the crowd is that it comes with both Centronics parallel and RS-232 serial interfaces built in, selectable from one of the two banks of DIP switches.

The printer has a host of facilities, including selectable baud rates for data transmission speeds; the ability to emulate either an Epson or IBM standard printer; eight international character sets; plus a three-way print buffer.

In either Epson or IBM mode, the GLP II has a 2K data buffer, and a 1.8K print buffer holding the data for a full line of print. However, in Epson mode, a third, "download", buffer is available. This allows you to send user-defined characters to the printer - ideal for Commodore owners, or those who want to print unusual characters such as scientific or mathematical symbols.

### THIS IS DRAFT MODE

### THIS IS COMRESSED MODE

### THIS IS EMPHASISED MODE

### THIS IS ENLARGED MODE

10 characters per inch.

Some of the print features are not usable in this form, but you can use NLQ together with underlined, enlarged and sub- and superscript.

All of these features are controlled through software by using Epson-standard ESCape codes. I would have preferred, however, a hardware setting for NLQ mode.

### Construction

On the whole, the GLP II is solid and well-built. It is very small - only 13 x 7.5 x 2.5 inches - but fairly heavy. This makes it ideal where desktop space is at a premium.

The print head looks a little flimsy, but during this test it performed flawlessly and Centronics claims a life of 50 million characters minimum.

The DIP switches are reasonably accessible in a trench under the print head; a lot better than the Epson method which requires dismantling the whole printer to get at them.

Print speed is fair with a claimed 100cps in draft mode, and 25cps in NLQ mode. In reality no printer reaches these quoted speeds and the GLP II is no exception. But NLQ speeds are still faster than the average daisywheel.

**This is Near Letter Quality (NLQ) mode.**

**The printed characters are larger and better-formed.**

**Note that you can also incorporate underlined and **bold** typefaces in NLQ mode.**

### Conclusion

The GLP II has a lot to commend it as a general purpose printer for home computer users. It's small, well-built and more than adequate for screen dumps and listings, while the NLQ mode is fine for letters and essays.

Business users would be better advised to look elsewhere, perhaps to the Epson LQ series or similar. For the rest of us, the GLP II is well worth a look and at £199 is very fairly priced.



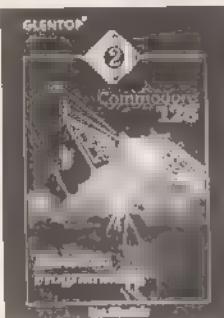
In addition to the usual print modes found on dot-matrix printers - condensed, enlarged, emphasised, sub- and superscript, etc - the GLP II features a near-letter quality mode (NLQ).

NLQ is printed using a 12-pin matrix at

The basic model comes with friction feed only, although tractor feed is an optional extra, and the paper path is such that paper can be positioned to start printing at the top of the first sheet, which saves a lot of paper.

**Hardware** Centronics GLP II **Price** £199  
**Supplier** Saga Systems, 2 Eve Road, Woking, Surrey GU2 4JT. Tel. 04862 22977.

## COMMODORE 128 Advanced Programming



The Commodore 128 can be used in three separate modes, the 128K mode is particularly attractive to the serious computer user. This book is intended for the owner who already knows the elements of programming in BASIC, and who wants to make the Commodore 128 work for its living. Because the BASIC of the 128 is so much superior to that of the older C64 model, much more can be accomplished without knowledge of machine code, and this book fully stretches the abilities of the new BASIC. The focal point of each chapter is the application of BASIC subroutines to data processing, and to that end

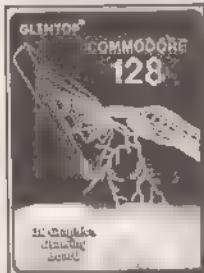
many very useful and original subroutines are included. You will learn, for example, how to work with pointers in BASIC, and how to speed up a string sort by the use of pointers to array members.

Whether your interest is for business or pleasure, hobby or profit, this is a book that will reward your reading and bring new perspective to your use of Commodore 128.

ISBN 1-85181-034-X

PRICE £5.95

## 3D GRAPHICS DRAWING BOARD FOR THE C64 AND C128



This software package allows you to create, alter and combine 3D images on the screen. This easy-to-use program is a breakthrough in graphics software - the 3D perspective images can be easily manipulated using the zoom, rotate, scale, stretch and move options. Hidden line removal adds further realism and the finished designs can be saved permanently to disc or printer.

PRICES C64 - £14.95 (disc only)

ISBN 1-85181-028-5

C128 - £14.95 (disc only)

ISBN 1-85181-029-3

## LEARNING ASSEMBLY LANGUAGE ON THE C128



A complete course with text and software, this step by step package introduces the complete beginner to 6502/6502 programming. The assembler provided with the course is especially designed for self teaching purposes so that once a basic understanding of assembly language is established, the reader can transfer to the actual Commodore built-in assembler with a minimum of effort and be free to explore the application of machine code.

The software contains a complete 6502 assembler/disassembler using Unified mnemonics, with Symbolic labels, Macros, Hard Copy, Memory Labels, and Save/Load.

The assembler allows programs to be written easily in assembly language and these it translates automatically into machine code.

ISBN 1-85181-027-7

PRICES £12.50 tape or £14.50 disc.

## WATSON'S NOTES FOR THE C128 + C64

Authors: D. Kedem & I. Kalisky

The concept of the Watson's Notes books is of a series of easy to follow units, each covering a specific area of BASIC programming. The books are aimed at younger readers, but any newcomer to computing will find that the style lends itself to clear and rapid progress through the various subject areas.



**C128**  
Unit 1: First Steps in BASIC £3.95  
C64:  
Unit 1: First Steps in BASIC £2.95  
Unit 2: Exploring BASIC £2.95  
Unit 3: Making BASIC Work £2.95  
Unit 4: Creative Graphics £3.95  
Unit 5: Sprites £3.95  
Unit 6: Concepts in Graphics £3.95

# GLENTOP

PUBLISHERS □ LIMITED

Standfast House, Bath Place, High Street, Barnet, Herts. EN5 5XE Tel: 01-441 4130 Telex: 22828

## Arnor terminates text file turmoil

It may seem biased but there are few Amstrad utilities that I have looked forward to as much as this extension to the excellent *Protext* word processor. The principal use of *Promerge* is to provide mail merge facilities, but Arnor has also taken the opportunity to improve the features offered for basic word processing.

CPC owners have been a bit spoilt to date since both *Tasword* and *Newword*, for example, have offered quite advanced conditional mail merge printing as standard. (This means that the text of the merge letter can be altered depending on the contents of the data supplied, for example, if phone number data is present, then print the block beginning "Please ring ...", etc).

Although it follows on the heels of both of these, hopefully *Promerge* will open up a new market of small business users for Arnor, especially since it always tries to go a bit further than the competition. First, *Promerge* is much more flexi-

ble than either of the above when it comes to reading data – it is likely that almost any program you own will be able to send data in a form that can be understood.

Reformatting of the text is automatic at printing, which *Tasword* doesn't do, and there are some extra facilities – for example you can test substrings in data and even remove part in the data at printing: 'Mr A Smith' can be printed as 'Dear Mr Smith'.

Extensions to the word processor include many more embedded commands that can be placed into the text to ensure that chores such as setting up the printer drive can be completely automatic. Those with Epson compatible printers can now use microspace printing (variable text size and proportional spacing) and can now both edit and print text in a choice of six foreign languages (the special characters appear both on screen and on the page).

Files can now be printed or viewed from disc without re-

placing the one in memory. There is also a typewriter mode for direct printing (useful for envelopes).

Finally *Protext* options can now be set from Basic so you can create a loader program on disc that configures the program exactly the way you want when it runs.

The disc and Rom versions are not identical; *Promerge Plus* on Rom offers even more than the disc, and also overcomes the restrictions on text size caused by loading both *Protext* and *Promerge* into Ram. Extra features include the ability to have two files in memory at once, Background printing of one file while another is being edited is also possible.

You can now move or copy blocks of text as defined 'boxes' or rectangles on screen (invaluable for tables of data or two column printing). There is a decimal calculator that can insert values into the text. Finally *Protext* can now automatically convert Ascii text files back to its own document type (replacing hard carriage returns with soft ones, etc) rather than just vice versa – feature that is enormously useful and,

as far as I know, unique.

CPC 6128 (or DKTronics Ram pack) owners can make use of the second memory bank such that the maximum text size is now 80K in two separate halves (blocks can be switched between them) which is about the same as the largest file that can be edited on a CF2 disc by *Newword/Wordstar*, etc.

It must be said that to buy *Protext/Promerge/Prospell* on Rom, which is essential to get the full advantage of power and memory space, will cost you a good £100 plus, but together with a 6128 and a decent printer you will have a set-up that can thrash any 8-bit word processor for speed and even cross swords with some 16-bit programs for power. If only it ran on the PCW as well, but then since this is the last of their advertised releases who knows what Arnor will be up to next?

Tony Kendle

## Disc dilemmas divided

These are a series of extremely clever and extraordinarily useful disc indexing programs ideal for those people who have recycled their 3 inch discs so often that the disc label is covered in scribble, or for those who have a tendency to save everything as *Letter1*, *Letter2*, etc.

*Findex* is a utility that allows you to name each of your discs very simply, A, B, C, etc. You can run your amended discs through *Findex* and it makes a complete index file of each record, its size, location, user number, etc. It is possible to selectively specify which files to include by the use of wildcards which are very more flexible.

Two related programs are also provided. *FileAnalysis* will study the index and recommend the optimum arrangement of files on your disc to cut down on wasted space. *FileManager* will allow you to mark certain files or filetypes in the index as condemned. Once this is done the files will

be erased the next time you index the disc even if they are set to *Read Only*!

*Keywords* is a utility that complements *Findex* and can be run from within it. It will simply search through and index every file on your discs that contain a certain keyword or combination.

*Doubledot* works best on word processor files and allows you to emulate one of the nicer features of *Locoscript*. It will allow you to enter up to ten lines of comments at the beginning of any text file, using typical *Wordstar* conventions to mark these comments although you can choose your own. The program will then work through the specified filetypes filling, displaying or printing these comments.

Tony Kendle

**Program Disc & file utilities**  
**Micro** All Amstrad **Price**  
£49.95 **Supplier** Newstar  
Software, 200 North Service  
Road, Brentwood

## PCW Pascal upgraded

**H**isoft Pascal is the third implementation of the language available for Amstrad owners, and for would-be programmers on a budget, it's the cheapest.

This new implementation also includes support for the GSX graphics system, which further reduces what little differences there were between the various packages.

Hisoft's version will run on either the 8256 or 6128 (or other CPC machines with expanded memory and disc). What you get is a text editor, compiler, a small library of routines, and a handful of demonstration programs including a turbo graphics interpreter.

Documentation is adequate as a reference guide but is not designed as a tutorial, so beginners at Pascal will need to buy one of the many standard introductions to the language.

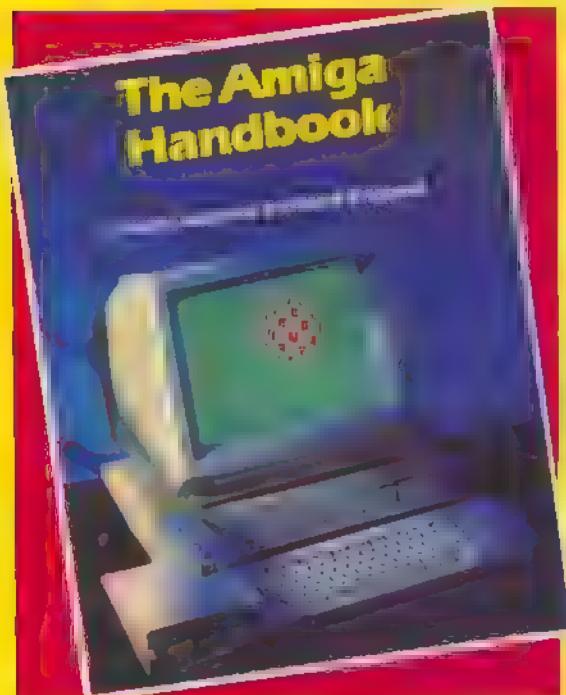
The major feature is now the GSX support, and this is comprehensive. The drawing of lines and polygons, block fills, and colour (on the CPCs) is supported, making graphs and business displays easy to produce.

Digital Research's Pascal/MT+ is a natural choice for computing students facing academic constraints, while Borland's Turbo Pascal is fast, fun and probably the one for real language buffs. However, if you want to sample Pascal, or you don't have much money to spare, Hisoft's version has a lot going for it.

Peter Worlock

**Program Pascal 180** **Micro**  
**Amstrad** 8256/6128 **Price**  
£39.95 **Supplier** Hisoft, 180  
High Street, North  
Dunstable LU6 1AT.

# JOIN THE REVOLUTION — BUY YOUR INTRODUCTION TO THE FUTURE



- ★ The easy-to-read Workbench environment and how to make it work for you
- ★ The kind of applications programs you need to build a system on the Amiga and how to use them effectively

**The new Amiga represents a revolution in personal computers. This book is the authoritative introduction to that revolution.**

**The Amiga Handbook** by David Lawrence and Mark England takes you behind the scenes to examine:

- ★ The custom-designed chips that allow the Amiga to outpace machines many times its price
- ★ The wide-ranging built-in libraries that control the Amiga's graphics, sounds, animation and speech
- ★ The 'Intuition' user interface that controls Amiga's windows and icons, and the more traditional text-based Command Line Interpreter
- ★ Programs in the powerful Amiga BASIC language to make the Amiga read a story, produce colourful graphs or simply print out a bill

**This is the first book for the Amiga.  
Buy the book and join the revolution**



To Theresa Lacy, Sunshine Books  
12/13 Little Newport Street  
London WC2H 7PP

Please send me \_\_\_\_\_ copies of **The Amiga Handbook** ISBN 0 946408 91 2 at £7.95 (plus 90p p&p) per copy.

I enclose a cheque/postal order for £\_\_\_\_\_ payable to Sunshine Books

Alternatively please debit my Visa  Access   
American Express

Account number \_\_\_\_\_ Expiry date \_\_\_\_\_

Signed \_\_\_\_\_

Name (capitals please) \_\_\_\_\_

Address \_\_\_\_\_

# Magikal mystery tour

Christina Erskine gets embroiled in the quest to destroy Mygilar in Level 9's latest, *The Price of Magik*

After *Terrors of Trantoss* last week, we continue on the adventure theme, with Level 9's latest.

Any new Level 9 title is eagerly awaited by its legion of followers, and the *Price of Magik*, sequel to *Red Moon*, is no exception. Now out on the Commodore 64, conversions are in hand for just about any machine you can think of.



*The Price of Magik* is a traditional style adventure – lots of spells to learn and use successfully, a wealth of locations to be explored – points earned for reaching the more out of the way ones – and all the usual baddies, werewolves, wraiths, an ancient sorcerer who has abused his power, and some not-so-usual ones.

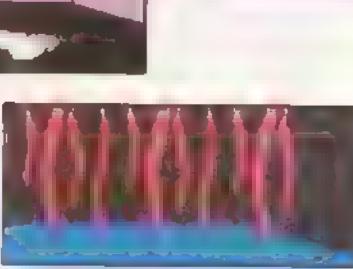
## The plot

Your aim is to find, learn and implement spells, and use the magical powers you learn throughout the game to defeat Mygilar, ex-noble guardian of the red moon crystal turned bad, and now concentrating all the red moon crystal's powers to pro-



tection system, though it uses it sensibly. You are not required to get the plastic out and start squinting straightaway. *Lenslok* is restoring parts of the game you have saved on tape so you can get quite a bit of gameplay in before running the gauntlet.

The instruction leaflet makes grand claims about the parser – "a wider range of English sentences than any other cassette-based game I've seen". Maybe so.



longing his own mortality.

Once you've done all your spell-finding, then of course you have to hunt down Mygilar himself.

## Gameplay

The game uses the dreaded *Lenslok* pro-

gram, but don't expect it to be completely bug-free.

Most of the anomalies appear when you type in a command, using a word not in the parser's vocabulary, and for some reason, it decides you mean another quite different word. This does not really detract from the gameplay, what is annoying (as always) is

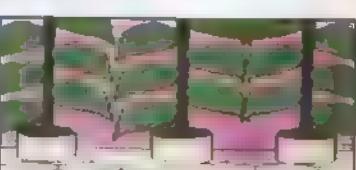
being told "I can't see it", when the damn object has just been described in the blurb.

The graphics are in true Level 9 style – somewhat crude, but recognisable illustrations, with some most peculiar colour combinations. In *The Price of Magik*, they're drawn very quickly, and, big plus, if you move out of a location before its picture has finished drawing itself, it'll move on straightaway – no hanging



around waiting for colour fills. To speed things up even more, the formation of pictures and text-printing is done simultaneously.

You begin standing outside a tumble-down house, where much of the action takes place; alterna-



exactly how to get to a chosen location is a must. Some locations need to be revisited several times, so you want to find the quickest route.

A wonderful addition to the parser is the *Oops* command (not available on every single version), which works as a take-back move, and can be used at any time. ■



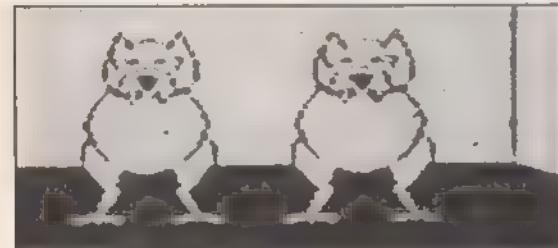
can get you out of situations which look fatal, and will put you back in the location immediately before.

The "price" referred to in the title, is your state of mind. The early stages of the game revolve around becoming insane enough to implement the magic you acquire. Every time you get the message *Your sanity is shaken*, it's good news. Every time you learn and implement spells, you move up the ranks - you start off as a sorcerer's apprentice, through conjuror, soothsayer, shaman, spellblinder, magician, wizard up to supreme wizard.

### Tips on playing

- Can't see in the dark? The *eyebright* needs to be rubbed into your eyes.

- The spells - there are 11 in all that you need - are the three letter "words" found, mainly inscribed, around the place. Each one needs a "focus", before you can use



it. The focus is an object you must be carrying, linked in some way to the spell and its action, eg, the "see" spell requires you to have a *feldspar* lens.

- If you can catch the blood-sucking bat - in a cage, perhaps, and drag it around with you, it'll come in handy when you come across the bloodworm.

- Slugs don't like salt.

- The *Oops* command comes in particularly useful when confronted with the chests - ten different coloured ones. Only one is of any use to you; the rest are positively dangerous, and the colour of the

useful one is randomly generated each time you play. Properly speaking, one of the spells is implemented here, but I'm assuming you find the chests before you discover the intricacies of that particular spell.

- A suit of armour is a must - and if you're going to get one, you'll need to collect and carry a lot of bones!

- More armour can be acquired from something wearing it already - but make sure you don't leave it running around naked!

- Many of the baddies you come across can be ignored - simply get out of the room. Some, of course, will be in key locations, and can't be avoided. Others aren't as vicious as they seem. You will be protected from the werewolf, for instance, if you explored the herb garden properly, and the monkey, despite the fact that it snarls and bares its claws at you at every opportunity, is actually very useful to have around.

- The pictures which you come across in many locations may seem merely decorative, but once you have found the "bom" spell, they'll be much more useful.

- If you type in *Score*, you'll be given a rating for sanity, status and age. Your score increases with every spell you use, and once it reaches 100, you're presumed dead. To keep young, find the red moon crystal.

- In combat, you'll be given stamina points - and once that reaches zero, you're also dead. To keep your strength up, the tapestry will be essential, once you've discovered the spell *galvanise* it.

- If you find an apparently useful object sticking out of the ceiling, but can find no way of reaching it (jumping, standing on

### The Price of Magik



### Level 9 Computing

books and peering through a feldspar lens being no use at all - nor is it any good hunting for a ladder. Then logically speaking, it should also be sticking out of the floor immediately above, shouldn't it?

- Reading the plaque in the river is a fiendishly complicated business. Basically, you need the silver mail, and you must do something sensible with all your possessions before diving headlong into the river.

*The Price of Magik* is available for the Commodore 64 now, and shortly



also for the Amstrad CPC series, Spectrum 48 and 128, Atari XL/XE, BBC (no graphics) and MSX. Tape versions cost £11.95. Level 9 can be contacted at PO Box 39, Weston-super-Mare, and will supply comprehensive cheat sheets to game owners on request.

## Bombo baulks at budget

**A**s if to prove once again that budget titles can be as good as the real thing, *Bombo* stands up very well to the "authorised" version *Bombjack*. Here - wait a minute - *Bombo* is £7.95! And I was just about to praise it unreservedly.



It just goes to show that the fine line between budget and full price software has now practically disappeared. Although *Bombo* is similar in many ways to the original game - with detailed backgrounds, a jet-packing hero, and a number of bombs to collect despite many enemies, it doesn't justify the full price tag. For a start, there are only three backgrounds, Mediaeval Brit-

ain, New York and Ancient Egypt. Secondly, the much-touted music by WeMUSIC turns out to sound like Rob Hubbard on a bad day, and thirdly there's an annoying flickering line towards the top of the screen which speaks of hurried programming.

That apart, the game plays pretty well - the flying eyes, birds, drones, hives and revolvers may not appear particularly menacing, but they get faster and trickier as the levels progress.

However, the layout - the 20 bombs which you have to collect on each level - is fairly straightforward until you have progressed to a high stage of the game, so it's not too difficult. As I said - *Bombo* would have been an excellent budget game, but doesn't have much to offer at £7.95.

Chris Jenkins

**Program** *Bombo* **Micro**  
Commodore 64 Price £7.95  
**Supplier** Rino, 1 Orange  
Street, Sheffield S1 4DW.

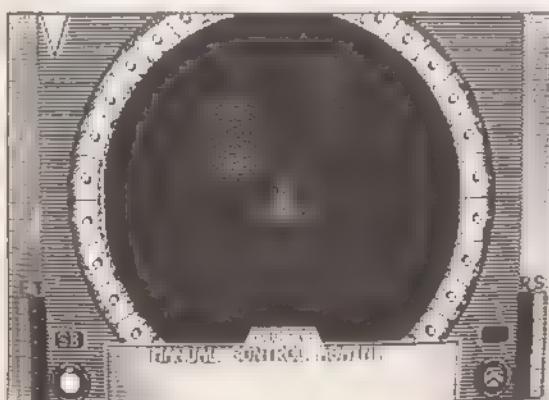
## The heart of the Empire

**T**he problem with *Empire!* is that it is not what it seems to be. It isn't anything like *Elite*, except that it involves trading in space. It isn't only, or even primarily, a galactic shoot 'em up either. This has led some people to be disappointed at what it isn't rather than celebrating what it is.

What it is, is a vast (estimat-

ed three months playing time) space strategy game, where blasting aliens sits alongside special missions, deciding objectives, defending systems and trading, your ultimate objective being to clear the universe of aliens by gradually securing more bases.

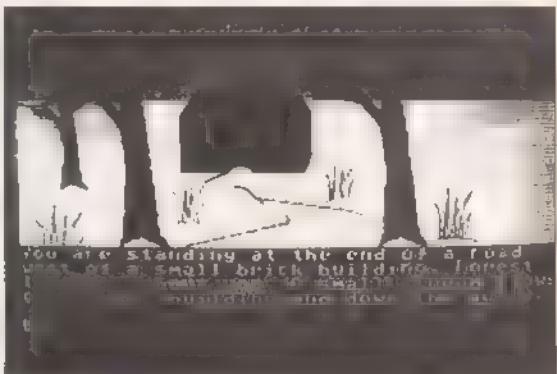
The first screens of *Empire!* (apart from the excellent loading screen) are not overwhelm-



## Big cave - big joke

**Y**ou are standing by a small stone hut, a river runs to the south

16,32". All your old favourites are here, such as, the evil dwarf, this time with ginger



(sounds familiar?), well it should do, because this latest release from CRL is based on the original Crowther and Woods Adventure. But do not be misled into thinking this is another 'clone', far from it, for this is the 'original' version found by a St Brides pupil innocently hacking into a computer system owned by the American Government.

You realise this version is going to be totally different when, on entering the hut, you see a pair of smelly wellies strange (but logical) you may think, but clearly not the same.

St Brides have done to Adventure what Fergus McNeil did to *Lord of the Rings* and in doing so have produced a wonderful, highly amusing game.

One witty part which rather pleased me was, when I waved the Black Rod, instead of a Crystal Bridge appearing, Tony Bridge appeared, uttering words of wisdom like, "See

hair, glasses and a beard but, instead of throwing an axe, he throws a sharpened ZX81 at you. Killing the python is done in a rather unusual way as well, what you need to do is... 'No, I think I'll let you work that out.'

The game comes in two parts, part two loads in after you have completed side one, also featured is a quick Save to Ram, something all games should have, and rather nice graphics.

So what are you waiting for? Pop down to your local store and buy a copy then rush home and enjoy all the fun of this terrific spoof.

Roger Garrett

**Program** *The Very Big Cave* **Adventure** **Micro** **Commodore 64** Price £8.95 **Supplier** CRL, 9 Kings Yard, Carpenters Rd, Stratford London E15.

ingly impressive - mostly the in-space fighting and travelling sections to the game look little better than asteroids. That's really not the point though, since they are only a small part of it. There are planets to land on, starbases to dock with, starmaps, hyperspace and all kinds of experience to be had. The screen displays vary from some rather nice 3D 'forward views' as you zoom across the planet surface to the top-down presentation of flying through space.

*Empire!* is an enormously complicated game, which will hook you if you give it a chance and start to become involved in the complex strategical elements. It isn't *Elite*, it isn't even graphically state of the art, but give it a go, you may...

Graham Taylor

**Program** *Empire!* **Price** £9.95 **Micro Spectrum** **Supplier** Firebird, Wellington House, Upper St Martins Lane, London WC2H 9DT.

## Hibernating hedgehog

**'E**llo - Spiny Norman 'ere - cousin of Spiky 'Arold who's just got 'imself into a computer game. Imagine - another blow for hedgehog power! And no you don't 'ave to run 'im over in your artie!

Wantin' to see whether 'e'd let down the family name in this new, low price Silver Range game, I loaded it into my Spectrum and off we went. *Spiky Harold Goes Hibernating* says the loading screen. Oh good, thinks I - something nice and peaceful where you try to keep a little hedgehog asleep. Roll over, Mrs Tiggywinkle!

But not a bit of it! Instead it's all about obtaining food from 54 chambers before you can put your feet up for the winter. Blow me if it ain't nothing more than *Jet Set Hedgehog*!

What separates it from the run of the mill jump and collect

games is its scale. At least they've done old Fatty 'Arold's girth justice - he's a big sprite. However, that's introduced problems of its own. There's a little graphics flicker, which I can stand because the scenery's lovely, and sluggish controls - which I can't suppose it may be momentum but it's very tricky to make 'Arold stop on a sixpence, and when you're talking about pixel accuracy, that's not good.

Sorry, 'Arold, but blow your royalties - I can only recommend this to hedgehog fanciers!

John Minson

**Program** *Spiky Harold* **Micro Spectrum 48K Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martin's Lane, London WC2H 9DL

## That sinking feeling

**T**he latest adventure release from Firebird is also the sequel to their earlier success *Subsink*. Once again you find yourself in an underwater situation: the first thing you discover is a dead body, searching the body reveals a passcard, which, when inserted into the appropriate slots, enables you to explore the seabase.

Not a very original plot, namely to find and stop a missile being fired towards Britain, but it is enhanced by the friendliness of the program. For example, on examining a conveyor belt we are told "you see nothing of interest but you can climb it". Nothing tantamount to a revelation but every little thing helps in an adventure. The program allows you to wander about the many locations at will, which is very nice if, like me, you like to get some

idea of what you need to do, before starting to piece the whole thing together.

The graphics are sharp and colourful; one of a shark, circling outside the observation bubble, was particularly impressive. The problems are not over difficult and, as in *Subsink*, not very logical.

Text descriptions leave a lot to be desired and I feel the overall atmosphere could have been made more stimulating by more lengthy wording; nevertheless, overall the game is quite enjoyable and should keep you occupied for some considerable time.

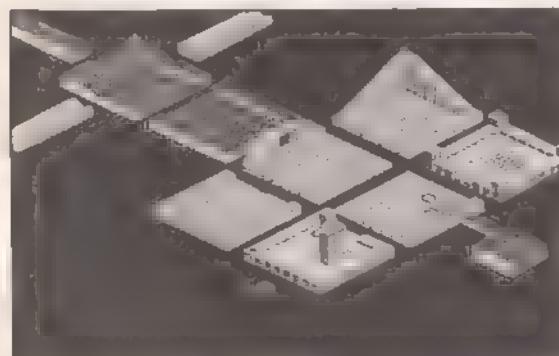
Roger Garrett

**Program** *Seabase Delta* **Micro CBM64 Price** £1.99 **Supplier** Firebird, Wellington House, Upper St Martin's Lane, London WC2

## In a spin over Spindizzy

**I**f you've been stunned by *Spindizzy* on the Amstrad or the Spectrum, you'll go wild over the Commodore 64 version. For those of you who have

which you must use to fully explore a strange artificial world in another dimension. The backgrounds through which Gerald spins are beauti-



not yet caught the bug, *Spindizzy* is a marvellous development in the ideas behind the arcade game *Marble Madness*, in which you steer an object with full inertial control over a bizarre landscape.

In *Spindizzy*, the object is Gerald - a spinning inverted pyramid (which can also take the shape of a gyroscope or a sphere if you are that way inclined).

Gerald - is a mapping robot

fully detailed, including planes, ramps, dips, jumps, trampolines, towers and causeways. Guiding Gerald is no easy task, and a plummet into oblivion is your reward if you stop up.

You can press the fire button to give Gerald an extra boost up ramps, and use the space bar to brake. Also (and you will not appreciate the importance of this until you are through the "beginners" section") and well

## Is the King Kong?

**A** long time ago, when the ZX80 was in the rage and the video arcades had just begun, an arcade game came out that was described as "The first full colour multi screen game". This game was known as *Donkey Kong* and hailed the way of the future. Today it is now available for the QL and it is called *The King*.

Once loaded up the game starts with you playing the part of a helpless factory worker called Mario, who has had his girl friend snatched from him, by an evil gorilla. Mario tries to save her by climbing up the different levels of the factory.

Into the game you can change your point of view using the function keys.

Your task is not only to complete the whole mapping task, which involves hundreds of increasingly difficult screens, but also to collect spinning jewels which can be found in the most inaccessible places. There are also puzzles to solve, such as the "music room" where moving over squares on the floor plays notes, the purpose of which you must determine. You have unlimited lives, but losing

only to find the gorilla taking her further up. While he tries harder to get closer, the monkey persistently throws barrels at him in order for him to die.

The controls are the cursor keys and the space bar is used to jump obstacles or get a hammer enabling you to smash the obstacles. The game is by no means original but is extremely addictive and quite well presented.

Matthew Palmer

**Program** *The King* **Micro ZL Price** £14.95 **Supplier** Micro Deal, Box 88, St Austell, Cornwall PL25 4YB

one causes you a time penalty.

*Spindizzy* is brilliant - great graphics, very complex, a challenge to both thought, and speed of reaction. Minimal sound - but nevertheless a vital purchase. Buy it.

Chris Jenkins

**Program** *Spindizzy Type* **Acorn Machine Commodore 64 Price** £9.95 **Supplier** Electric Dreams, 31 Carlton Crescent, Southampton, Hants



## First Superman – now Redhawk

*Tony Bridge looks through a batch of new releases, including Redhawk and Heavy on the Magick*

The latest release from Melbourne House is, I'm glad to report, very interesting. Adventurers Redhawk concerns your exploits as Kevin Oliver/Redhawk, a combination of human and superhero not too far removed from Clark Kent/Superman or David Banner/Hulk. Unlike those two, however, your character doesn't have to undergo any particular traumas to become invincible – none of that tiresome finding an unoccupied phone booth or waiting to be smashed in the teeth. Just the simple utterance, "kwaah" will suffice to turn you into the hooded wonder. But I'm getting ahead of myself: what strikes the player at the start is the layout of the game.

As Graham Taylor said in the magazine a couple of weeks back, the idea is so simple and so obvious it's surprising that no-one has thought of it before: a comic strip unfolds itself before your eyes as the game progresses, and speech bubbles contain the words that you have commanded your character to utter. As a superhero of real Marvel proportions, you find yourself pitted against equally super-villains; in this game, though, you can fight against evil or align yourself with the forces of darkness. The display reflects your popularity rating as well as your strength as you make your way towards rescuing somebody or other from something or other.

From what I've seen, the actual adventure is not so hot (I'm sure that we'll see others in the series – indeed I hope so) but it is the friendly environment that is so interesting to see; this extends even to the saving, loading and restarting routines, and the on-screen editing of commands – this last is particularly useful, allowing the player to backtrack several inputs and either correct mistakes or re-use a recent

command. The graphics are good (exactly the same on Spectrum and Amstrad versions, though I seem to move more slowly in the Amstrad version for some reason) and the adventure, though rather basic, is well worth looking at.

By the time you read this, Level 9 should have released *The Price of Magik* at least for the Commodore (see elsewhere in this issue) although the usual comprehensive range of micros should eventually be catered for. Judging by the sneak preview that I was given on the Atari ST, *Magik* is a return to mainstream adventures for Level 9: at the start, the player can walk up to an old house, climb the ivy thereupon, clamber into the attic and start exploring. I'm sure though that the problems met will be just as devious as previous Level 9's!

While talking of Level 9, its interest in the latest 16-bit computers has paid off for QL owners in the form of a three-pack of the original Level 9 adventures, the *Middle Earth* series. While the new versions follow the original story lines, Level 9 have taken advantage of extra memory to expand on the scenarios and make them even more wonderful than before.

### Strong competition

This week, I caught my first glimpse of Magnetic Scrolls/Rainbird's opus for the Atari ST, *The Pawn* – as you'll know, this was first released on the QL as a text-only affair and I discussed the adventure in length in the corner of October 16. The lengthy descriptions ensure a certain amount of atmosphere and there are several in-jokes to be enjoyed. The parser, though it was fairly spectacular on a quick look, doesn't live up to Magnetic Scrolls' promise: at one point, a trapdoor is men-

tioned, but trapdoor doesn't appear in the vocabulary of the adventure. The authors are apparently would-be Infocom-bashers, though *The Pawn* resembles the Infocom classics like a herd of elephants. There are many moments of charm, certainly, and the graphics on the new ST version are superb (and I could play with them for hours, pulling the pictures up and down like venetian blinds), but with Level 9 beavering away to bring its programs to the QL and ST/Amigas, the competition will be strong.

### Good scenario

I've only got space to mention two more new releases, but they are both very interesting and worth your attention.

Ramjam is best known by adventurers for *Valkyrie 17*, a very droll text/graphics affair that enjoyed great success when it was released a year or so ago. Its new adventure has been some time coming but is a cracker. In *Terror of Trantoss*, some beautiful graphics support a good scenario in which the player can switch between two characters in classic adventuring and hack 'n' slash situations (see last week's issue for a preview).

Meanwhile, Gargoyle carries on with its range of idiosyncratic games – no other software house is quite like it, and it always comes up with something stunning. With *Heavy on the Magick*, Gargoyle has yet again done everything right. The graphics are, as usual, superb and evocative – the scenario concerns your character, Axis the able (or Axis the merely adequate) in his quest in the dungeons of Collodon's pile. Though this sounds like some rather personal disease, it's actually the perfect setting for some more hack 'n' slash, with dragons, wraiths and all the rest making an appearance for your delight. Though I keep getting stomped on by Apex, the crusty idiot, I found plenty to do, with examinable objects galore, lots of spells to use (once you figure out how), and all the usual Gargoyle puns.

There are 255 rooms to explore, 21 different animated monsters including wyrms, werewolves, vampires and all the usual goodies, 280 (count 'em) objects to examine and use – and the program recognises 400 words, which ought to be enough! Another Gargoyle classic!

### Adventure Helpline

Going bananas? If you are stuck in an adventure with nowhere to turn do not despair – help is at hand.

Fill in the coupon, explaining your prob-

lem, send it to us, and a fellow adventurer may be able to help.

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure.....

Problem.....

Name.....

Address.....

on (Micro).....

## ADVENTURE HELPLINE

Hampstead on Spectrum. Where exactly do I find the lathe bracket? P Collingson, Red House, Thorpe Lane, Fylingthorpe, Whitby, N Yorks 7022 4TN

Adventure Quest on Spectrum. Can't get past Djinn to Oasis is there a way down rusty grating near start? Mr D J Lay, 91 Allport Lane, Bromborough, Wirral Merseyside L62 7HL

Red Moon on Spectrum. How can I use spells, the iron always inhibits my Magic. David Edgar, 1 High Parkside, Erskine, Scotland PA8 7HY.

That's the Spirit on Spectrum. How to get past the cat and the Phantom in the church. Mr G Hoyle, 15 Ashbourne Crescent, Taunton, Somerset TA1 2RA.

Woodbury End on Electron. How do I get out of the darkened room? Miss I H Legat, 88 Yarborough Close, Godshill PO38 3HS Isle of Wight.

Fourth Protocol on Spectrum. What does Subsector mean and any other hints. S G Oglesby Goss, RAF Gatow BFPO 45.

Mareport on Spectrum. Which Objects manu-

facture A and Y tokens? Vincent Johns, 12 Newlands Avenue, Syke Rockdale, Lancs OL2 0BN.

Lord of the Rings on Spectrum. I have solved part 1 but am now stuck in Lothlorian. Any help gratefully received. Andreas Jantzen Peter, Peterstr. 8 6808 Vierheim, W Germany.

Land of Illusion on Atmos. How to open the door to Barthogs Castle. Have got mushrooms, inscription, and vanishing potion. Martin Tubb, 35 Poplar Court, Gap Road, Wimbleton SW19

Bored part 3 on BBC. What use is De-Bugger, how do I open box in store? Peter Lord, 6 Wellswood Gardens, High Meadows, Exeter, Devon.

Sherlock on Spectrum. How do you decode the codes given by Basil? Don Green Radlett 2673.

Fourth Protocol on Spectrum. What is the lift past word. Marc M, 18a Granbridge St, Bellington, London N1 8JN.

Sea Quest on BBC. How do I get the key from the Mermaid? Clive David, 12 Gran Florad Rhuabina, Cardiff CF4 6ST.

Madness and the Minotaur. I can't find anything? As above.

Fourth Protocol part 2 on C64. How do I get into the industrial estate once I've told guard the plot No which is CI do I need an item to open

gate. LCPL Payne, J Troop 2 Sqn, 21 Sigregal, Bp 36.

In Search of Holy Grail on C64. Cannot open aramaic Dictionary or become invisible to go north past eggene. Mrs Wilson, 78 Richmond Road, Derby DE3 8PX.

Eureka on CBM64. What is the password at the beginning of the Caribbean adventure? C Nicholas, 123 Grimthorpe Hse, Agdon St, London EC1 VOBR.

Bored of the Rings on Spectrum. How do I find the paper to get past the Morona Gate at the end of Part One? John Kean, 120 Furness Road, London NW10 5UH.

Ring of Darkness on Dragon 32. Unable to survive the first stages of the game. Tips would be grateful. Miss M Book, 11 Bradford Road, Boston, Lincs.

Escape from Pulsar 7 on C64. How exactly do I find the cable? I think it's in the wrecked cabin. Len Shuttleworth, 12 Ricchborough Close, Orpington, Kent BR5 3TQ.

Keratiks on C64. How do I get past the door to Akuna's fortress. It keeps hitting on me. Darren Gregory, 29 Ludlow Grove, Blackpool F72 0PZ.

Starcross on C64/Apple II. No score or progress. Any tips at all, please Darren Gregory. (for address, see above).

## BITS & BYTES COMPUTERS

### BITS & BYTES COMPUTERS

UNIT 4

OLD SWAN SHOPPING ARCADE  
GREEN LANE/PRESCOT ROAD  
OLD SWAN LIVERPOOL 13

TEL: 051-259 5748

SEND LARGE S.A.E.  
FOR FREE CATALOGUE



### MAIL ORDER HOT-LINE

051-264 7362

### NEW TITLES AVAILABLE FROM DAY OF RELEASE

JOIN THE BITS & BYTES COMPUTER DISCOUNT CLUB FOR THE CHEAPEST PRICES PLUS FREE GIFTS!  
ONLY £2.50 FOR LIFE MEMBERSHIP. SPECIAL OFFER! FREE GIFT IF YOU JOIN BEFORE 31st MAY 1986

### CHART TITLES AT DISCOUNT PRICES

### BITS & BYTES COMPUTERS

31 BOLD STREET  
LIVERPOOL CITY CENTRE  
LIVERPOOL  
L1 4ND

TEL: 051-709 4036

UNDER 7 TOP TITLES  
CHOOSE A MASTERTRONIC  
GAME (V9) PRICE

COMMODORE 64	RLP	PRICE	SPECTRUM	RLP	PRICE	AMSTRAD	RLP	PRICE	C16	RLP	PRICE	B.S.C.	RLP	PRICE
MINIMINE	9.95	7.25	Bomb Jack	9.95	9.95	Way of the Tiger	9.95	7.25	Commando	9.95	5.95	Commando	9.95	7.25
5	9.95	7.25	Way of the Tiger	9.95	7.25	Spider - U2 City	9.95	7.25	Winter Olympics	9.95	5.95	Winter Olympics	7.95	5.95
They Sold A Million	9.95	7.25	V	9.95	6.95	They Sold A Million	9.95	7.25	C16 Classics II	9.95	7.25	Karate Combat	6.95	6.95
Spun Dizzy	9.95	7.25	Spin Dizzy	9.95	7.25	Ping Pong	9.95	7.25	Kung Fu Kid	9.95	5.95	Way of Kun Fu	9.95	7.25
Bomby Jack	9.95	7.25	Green Beret	9.95	7.25	Super Bowl	9.95	7.25	Airwall	9.95	7.25	10 Computer Hits II	9.95	7.25
Way of the Tiger	9.95	7.25	Super Bowl	9.95	7.25	Get Fender	9.95	7.25	Football Manager	9.95	5.95	Citadel	9.95	7.25
Star Quarks	9.95	6.95	Beetman	9.95	7.25	Decomputer Blues	9.95	7.25	Ace	9.95	7.25	Phantom Combat	9.95	7.25
Phase the Titanio	9.95	7.25	Boulder	9.95	7.25	Frome goes to Hollywood	9.95	7.25	Green Tentacle	9.95	7.25	Phantom Combat	9.95	7.25
Reapin	9.95	7.25	Max Headroom	9.95	7.25	Max Headroom	9.95	7.25	Dragon	9.95	7.25	Earth Force Hunter	9.95	7.25
Horror Focul	9.95	6.95	They Sold A Million	9.95	7.25	20-0	9.95	7.25	The Barking Trilogy	9.95	5.95	Way of the Exploding Flap	9.95	7.25
Horror Focul	9.95	6.95	Ping Pong	9.95	5.95	Movie	9.95	7.25	Manic Miner	9.95	5.95	10 Computer Hits I	9.95	7.25
Horror Focul	9.95	6.95	Crash Smashes	9.95	7.25	Batman	9.95	7.25	Defence 18	9.95	7.25	3-D Grand Prix	9.95	7.25
Turbo Esprit	9.95	6.95	Quasimodo	9.95	7.25	Kazam	9.95	7.25	Reach for the Sky	9.95	5.95	Typhoon Pack (6 games)	9.95	7.25
Super Bowl	9.95	7.25	Mugatu Revenge	9.95	7.25	Turbo Esprit	9.95	7.25	Jet Brus	9.95	5.95	Repton Pack	9.95	7.25
Herdbull	9.95	7.25	Sky Fox	9.95	7.25	Alien Highway	9.95	7.25	Space Pilot	9.95	4.95			
Zap Sizzlers	9.95	7.25	10 Computer Hits II	9.95	7.25	Panzadrome	9.95	5.95	Manic Deathchase	9.95	4.95	ELECTRON		
10 Computer Hits II	9.95	7.25	Who Cares What II	9.95	7.25	Tornado Low Level	9.95	7.25	Deley Thompson State Events	9.95	5.95	Exploding Fret	9.95	7.25
Fairlight	9.95	7.25	Star Struck II	9.95	7.25	F.A. Cup Football	9.95	5.95	Rescue from Zylph	9.95	5.95	Mouse Trap	9.95	5.95
Max Headroom	9.95	7.25	Star Struck II	9.95	7.25	Foot in Whistle	9.95	7.25	Out of Dharma	9.95	5.95	Out of Dharma	9.95	5.95
Horror Focul	9.95	6.95	Tennis	9.95	7.25	Braveheart	9.95	7.25	Pete's Doom	9.95	5.95	Tranquillity Hunt	9.95	7.25
Horror Focul	9.95	6.95	Turbo Esprit	9.95	7.25	Second & Scattery	9.95	7.25	Hustler	9.95	5.95	Search Head	7.95	5.95
Electrified	9.95	6.95	Baseball Future	9.95	7.25	Thief	9.95	7.25	Diagon	9.95	2.95	Thi-Sloping	9.95	4.95
Arcade Classics	9.95	7.25	Heavy on the Magic	9.95	7.25	Thief	9.95	7.25	Twin Kingdom Valley	9.95	2.95	Steve Davis Snooker	9.95	5.95
War Party	9.95	6.95	Alien Highway	9.95	7.25	Space Escort	9.95	6.95	Space Escort	9.95	2.95	10 Computer Hits II	9.95	7.25
Assylum	9.95	7.25	Hot Shots	9.95	7.25	Hyperports	9.95	6.95	Typhoon Tex	9.95	6.95	10 Computer Hits I	9.95	7.25
Red Hawk	9.95	5.95	Hot Shots	9.95	7.25	Red Hawk	9.95	6.95	Gamblinger	9.95	6.95	Dynamite Collection (Spaniel)	9.95	5.95
Quadrax Revenge	9.95	7.25	Alien Highway	9.95	6.95									
Prints Trading Company	9.95	7.25	Red Hawk	9.95	7.25									
Boulder Dash II	9.95	7.25	Boulder Dash II	9.95	7.25									

COMMODORE COMPENDIUM PACK £169.99   Cheetah Joystick £7.95   DISK GAMES ALSO AVAILABLE   HUGE SELECTION OF ATARI GAMES  
SEND CHEQUES/P.O.'s TO:

PRICES INCLUDE V.A.T. & POSTAGE. ADD £1.00 PER ITEM FOR OVERSEAS ORDERS

**BITS & BYTES COMPUTER (LTD) MAIL ORDER DEPARTMENT**  
40-42 BALMORAL ROAD, FAIRFIELD, LIVERPOOL L6 8NF.   TEL: 051-264 7362



## Mars bars and citadels

**Tony Kindle** welcomes the conversions of *Bomb Jack* and *Moon Cresta*, gives some tips for Superior's *Citadel*, and continues the *Marsport* solution

It has suddenly become fashionable in the computer games industry to be critical of licensed deals and arcade copies in particular. Mel Croucher, ex of Automata, seems to be leading this crusade with calls for more originality in software design. In many ways I agree with him; especially that there should be room for the creative artist in the games world. I felt Automata's *Deus Ex Machina* was, and is, excellent and the latest project, *ID* for CRL's Nu-Wave label, contains some fascinating new concepts. Both are important steps towards clarifying the future contribution computers can make to home entertainment for the more sophisticated player.

Where I think our ideas differ is that I can't understand why a game that was initially created for a coin arcade machine should be regarded as somehow less valid or less creative than a game that has been designed from scratch.

### High quality

Computers are becoming more advanced every year, standards demanded of software are increasing even faster and most of our best games are of necessity becoming a team effort. It is no longer reasonable to expect those who are skilled in programming to take on the role of games designer as well and once you have accepted the need for an 'ideas team', it becomes irrelevant whether these are based abroad in a company such as Konami or Atari.

Two of my favourite games at the moment are Elite's *Bomb Jack* and Incentive's *Moon Cresta*. Elite has deservedly struck a small goldmine with its extremely high quality conversions and it has to be said that they are in many cases much more playable than some of its earlier games - I mention no names but I'm sure that the image of helicopters relentlessly crashing into walls will spring to some people's minds.

*Moon Cresta* has been a long time coming for the Amstrad and BBC, but the quality is again superb with subtle and clever attention to detail. Perfect addictive stuff for those spare half hours when you can't face 8-bit social commentary.

Richard Kercher of High Wycombe has written, voicing the unfortunately true complaint that for some time there have been no tips for the BBC micro. However, rather than stopping there, Richard has

demonstrated that he is a man of resource and no small intellect by starting the ball rolling again with these tips for the new Superior Software game, *Citadel*.

1) To get past the mummies in the pyramid drop the idol head on to the platform. Drop the green man idol on the coffin in the pyramid and get the crystal. 2) To get past the witch drop the skull and two bones into the cauldron. The witch passes over the cauldron and dies.

3) In the lab drop the cannon ball and the bottle marked P (gunpowder) into the white cannon. This enables you to get the crystal. 4) Drop the stone blocks (the cyan coloured ones) as you pass Stonehenge to get extra energy.

5) To get past the guard in the temple get the chicken and put it on the pad until it cooks. Go to the temple and you won't get attacked. 6) When using the starport don't collect the crown object in the palace until the last - it destroys Starport when you return.

Richard's personal best score is 95 points and he now wants to know what the barrel is for. I would like to echo that with a request for more help on this.

Now then let's get on with some more tips for Gargoyle's *Marsport*. If you can remember back to before our little interlude with David Jones's *Spellbound*, we left Commander John Marsh on Taxa level

*Bomb Jack* from Elite



just through the danger room. Most players should have found the ice cream room on that level and within it the cornet and the ice pack. The cornet is the key to the music room which you will find on Level F, and which contains a lute and a mute. The ice pack is the key to the hot house on Level H where you will find a geranium for the plant room on Jolly level. If you haven't found these rooms yet, don't worry.

Going back through the danger room on Taxa level and exploring for a bit will soon bring you to the map room. In here you will find three important objects - the Earth map, the Mars map and the Sun chart.

### Hidden away

Exploration of Taxa will also bring to light some glass as a flame, both held in sectors patrolled by the sept so be careful. The Sun chart, the glass and the frame can be factored together to make sunglasses (eyeshields). The Mars chart is the key to get into the bar when you find it (it's a Mars bar, of course) and the Earth map is the key to get into the soil depot on Gill level. The bar will contain tea whilst getting through the depot will give you access to a lift to a previously hidden part of level A, where you can try the sunglasses out in the Astronomy room. You will then find an empty tank and also be able to get a lift down to level B.

The object in the first part of the game is to find the three keys to m-central. The first key can be found quite easily by just taking the up tube from Daly to Alba and going to the director's office. The second key is in the bank on level B. To get into the bank you will need the dough from the bakery.

Once you have got on to level B the most important room for you to find next is the oratory. In here you will find a projector, a dais and a points (note the spelling!). The most immediately useful is the dais which when factored with the lute gives a Lead Suit. I must confess I was stuck for hours here, not expecting something as subtle as an anagram.

With the lead suit you can cross the danger radiation room on this level. This gives you access to a lift to a new part of Jolly where you will find safety boots and earmuffs. The boots are, inevitably, the key to the chemists back on Daly where you will find a syringe, some vallum and some oxygen. The latter can be factored with the empty tank to make an air tank. More next week.

# NEW!

## M/DRIVE DOCTOR (Spectrum 48K/+ /128K)

Extends BASIC to provide extra disk-like commands.  
\*Rename facility \*Sector restorer \*Full catalogue  
\*MEGAFORMAT (108-120K) \*Cartridge clone (2 drives)  
\*Merge ANY program \*Default drives and wildcards  
\*File finder \*Printer output \*Special commands for advanced users and much more. Compatible with all Interface One ROM types. Included is a full sector editor program for on screen alteration of data.

... this program is an excellent buy... useful to anyone who uses microdrives seriously... Highly recommended" (Simon Goodwin - Author Of SUPERCHARGE).

"excellent utility..." (S. Crow - Author STARQUAKE)

AVAILABLE MAIL ORDER ONLY. SUPPLIED ON CARTRIDGE COMPLETE WITH A 2500 WORD USER MANUAL FOR £7.80 inc P & P. (Price £8.80 inclusive outside U.K.)

QL version coming soon. Enquire for details.

SEND CHEQUES/P.O TO:

'PIPEQ SYSTEMS'  
151 MILLBRIDGE  
DOLLS VALLEY WAY  
BARNET  
HERTS EN5 2UB

**PIPEQ  
SYSTEMS**

--11: Home Computers

## SPECIAL OFFERS.

### SPECTRUM:

OPUS DISCOVERY 1 DISK SYSTEM.....	£119.00
DK'TRONICS KEYBOARDS.....	£29.95
RAM TURBO JOYSTICK INTERFACE.....	£15.00
BETA MAGIC BUMPER DISK INTERFACE.....	£108.00

### DISK DRIVES:

*500K EPSON DOUBLE SIDED 40Track.....	£125.00
*1MB " " " 80 " .....	£150.00
BBC 40T SINGLE SIDED 100K.....	£84.50

(All drives are case'd. Exports have F.R.U.'s built-in. Discount 2+Drives)

### CASSETTES & DISKS:

100s	150s	200s	300s
10 £3.80	£4.00	£4.15	£4.60
20 £7.00	£7.20	£7.40	£8.20
50 £15.00	£16.20	£15.90	£17.50
100 £27.00	£28.00	£29.00	£33.00

(PRICES INCLUDE LIBRARY CASES AND POSTAGE & PACKING)

10 x 5½" DS/DD £10 (includes Plastic Case)

10 x 3½" SS/DD £25 (boxed)

### PRINTERS:

PANASONIC 1090 96cps. NLQ. CENTRONICS.....	£175.00
SHINWA CP80A+ .....	£189.00
QL. Centronics Interface & Cable.....	£24.95

ALL GOODS FULLY GUARANTEED. ABOVE PRICES ARE FULLY INCLUSIVE OF VAT, POST & PACKING. ORDERS ENQUIRIES TO

**UK HOME COMPUTERS**  
82, CHURCHWARD AVE, SWINDON, WILTS. SN2 1HH  
TELEPHONE (0793) 695934

# C16 PROGRAMMERS YOUR PROGRAM FOR AN EXCITING FUTURE

- 1 Sign a C16 programming deal with Gremlin
- 2 Develop your ideas with our team of experts
- 3 See your idea emerge into a professional marketing package
- 4 Watch it zoom up the charts
- 5 COUGH! COUGH!  
Light a big fat cigar SPLUTTER!
- 6 Order your Porschell
- 7 Book a holiday in the Caribbean
- 8 Become a Tax exile

But seriously... when it comes to developing and promoting C16 software they don't come any better or any more experienced than Gremlin. Whether you have games complete, concepts under development or just superb programming skills contact GREMLIN TODAY. It could be your first step on the road to fame and fortune. We are also interested in programs and programmers for CBM 64, Atari, Amstrad, MSX and Spectrum.

## Gremlin Graphics

Write to: Ian Stewart.

Gremlin Graphics Software Limited, Alpha House,  
10 Carver Street, SHEFFIELD S1 4FS. Tel: 0742 753423

MSX · COMMODORE · ATARI · AMSTRAD · SPECTRUM  
WE PRODUCE RESULTS ACROSS THE BOARD

# Readers' survey

We reckon it's about time to find out exactly what you, the readers, think of *Popular Computing Weekly*—what you like about it, what you don't like, what you would like to see more of.

You can help us by filling in the survey printed below. In doing so, you'll also help the charity War on Want, because for every completed questionnaire we receive, we'll donate 10 pence to WOW. The money will go to its general fund which goes to help fight poverty in the Third World, just as does money spent on WOW's compilation tape for the Spectrum.

Send your completed survey off to Readers' Survey, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to reach us by Monday, June 16. We will publish the results in a future issue of the magazine.

## 1 Which of the following computers do you own?

Acorn BBC  Amstrad 464/664/6128  Acorn Electron  Amstrad PCW 8256/8512   
Atari ST  Commodore 64  Commodore 128  Sinclair Spectrum  Other (please specify)

## 2 When did you buy your first computer?

Within last six months  1-2 years ago  Six months to 1 year ago  More than 2 years ago

## 3 How long have you had your current computer?

Less than six months  1-2 years  Six months to 1 year  More than 2 years

## 4 Do you plan to buy a new computer this year?

Yes  If yes, please specify model  No

## 5 Which of the following peripherals do you own?

Monitor  Disc drive  Microdrive  Light pen  Plotter  Other (please specify)  Printer  Modem  Graphics tablet  Mouse

## 6 Which of these peripherals do you plan to buy this year?

Monitor  Disc drive  Light pen  Plotter  Printer  Modem  Graphics tablet  Mouse

## 7 How much do you spend on software each month?

Up to £10  £20-30  £10-20  More than £30

## 8 How much time do you spend at your computer each week?

Less than 2 hrs  10-20 hrs  2-10 hrs  More than 20 hrs

## 9 What is the main use of your computer (tick one only)?

Programming	<input type="checkbox"/>	Games	<input type="checkbox"/>
Word processing	<input type="checkbox"/>	Communications	<input type="checkbox"/>
Graphics	<input type="checkbox"/>	Music	<input type="checkbox"/>
Other (please specify).....			

## 10 Do you program in any of the following languages?

Basic	<input type="checkbox"/>	Machine Code	<input type="checkbox"/>
Pascal	<input type="checkbox"/>	Forth	<input type="checkbox"/>
Logo	<input type="checkbox"/>	Lisp	<input type="checkbox"/>
C	<input type="checkbox"/>	Fortran	<input type="checkbox"/>
Other (please specify).....			

## 11 How often, on average, do you buy *Popular Computing Weekly*?

Subscriber	<input type="checkbox"/>	Buy every week	<input type="checkbox"/>
Buy every other week	<input type="checkbox"/>	Buy once a month or less	<input type="checkbox"/>

## 12 Do any other people read your copy of *Popular Computing Weekly*?

None	<input type="checkbox"/>	1-2	<input type="checkbox"/>
3-5	<input type="checkbox"/>	More than 5	<input type="checkbox"/>

## 13 What is your main reason for buying *Popular Computing Weekly* (tick one only)?

News	<input type="checkbox"/>	Games reviews	<input type="checkbox"/>
Other software reviews	<input type="checkbox"/>	Hardware reviews	<input type="checkbox"/>
Arcade Action	<input type="checkbox"/>	Adventure Corner	<input type="checkbox"/>
Programming features	<input type="checkbox"/>	Advertisements	<input type="checkbox"/>

## 14 Please rate the following features according to whether you would like more, about the same or less coverage.

	More	Same	Less
News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Letters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hardware reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Games reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other software reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arcade Action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adventure Corner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programming features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New Releases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peek & Poke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bytes & Pieces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Games charts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Swap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advertisements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 15 How interested are you in the following subjects?

	Not at all interested	Somewhat interested	Very interested
Computer books	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer languages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DIY hardware projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computers in business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computers in education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New technology (eg CD-Roms)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 16 Which of the following magazines do you buy regularly?

Crash	<input type="checkbox"/>
Your Sinclair	<input type="checkbox"/>
Sinclair User	<input type="checkbox"/>
ZX Computing	<input type="checkbox"/>
Zzap 64	<input type="checkbox"/>
Your Commodore	<input type="checkbox"/>
Commodore User	<input type="checkbox"/>
Commodore Computing International	<input type="checkbox"/>
Amtrix	<input type="checkbox"/>
Amstrad Action	<input type="checkbox"/>
Amstrad Computer User	<input type="checkbox"/>
Computing with the Amstrad	<input type="checkbox"/>
Atari User	<input type="checkbox"/>
QL World/QL User	<input type="checkbox"/>
Personal Computer World	<input type="checkbox"/>
Your Computer	<input type="checkbox"/>
Byte	<input type="checkbox"/>
Other (please specify).....	<input type="checkbox"/>

## 17 Please give one way in which you think *Popular Computing Weekly* could be improved.

.....

.....

.....

.....

.....

.....

# POOLWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- MASIVE DATABASE** Poolwinner is a sophisticated pools prediction aid. It comes complete with the largest database available - 22000 matches over 10 years. The database updates automatically as results come in.
- PREDICTS** Not just SCORING, but AWAY, HOME AND NO SCORES.
- SUCCESSFUL** SELE测 shows that Poolwinner performs significantly better than chance.
- ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique system.
- SIMPLE DATA ENTRY** All team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture lists automatically (see below).
- DISC/MICRODRIVE COMPATIBLE** Tapes supplied with conversion instructions.
- PRINTER SUPPORT** Full hard copy printout of data if you have a printer.



Shared with detailed  
instruction booklet

AVAILABLE FOR Spectrum (480), Commodore 64, VIC 20 (+160), AMSTRAD, BBC II, Atari (48K), ZX81 (16K), Dragon, Apple II, ELECTRON

PRICE £15.00 (all inclusive)

as PAPER  
New Amstrad or the 4K  
Amstrad PCW  
and 16K 3.5" disk

AT LAST! No more struggling for hours to get the fixture list for the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1986/87. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolwinner.

POOLWINNER with FIXGEN £18.50 (all inclusive)

Coursewinner



## COURSEWINNER V3

NOT JUST A TUPPER PROGRAM, COURSEWINNER V3 can be used by experts or novices alike.

You can develop and test your own unique racing program by adjusting the analysis formula, or use the program in sample mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, price, money, weight, going, trainer and jockey form etc. etc. It outputs most likely winners, good long odds bets, forecasts, trifectas etc. The database includes vital course statistics for all British courses. You can update the database - never goes out of date.

AVAILABLE FOR Spectrum (480), Commodore 64, VIC 20 (+160), Amstrad, BBC II, Apple II, PRICE £15.00 (all inclusive) includes TAP and National Horse version.

Bend Cheques/Tel for return of post service no...



phone 24 hrs



SINCLAIR



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. 061-428 7426

(Send for full list of our software)

## HIGH RESOLUTION COLOUR MONITOR

Essential for text and superb for graphics



Chroma I

14" SCREEN RESOLUTION (585 x 895 PIXELS)

from only £249.95 inc VAT

SOUND FACILITY AVAILABLE

£17.50

Available in Wood or Metal Case

for SPECTRUM, SINCLAIR QL and BBC.. £249.95 inc VAT  
for AMSTRAD in 5volt and 12volt supplies £264.95 inc VAT  
for ATARI 520 and 1040 £269.95 inc VAT

Sound Facility for spectrum Amstrad and Atari, £17.50 inc VAT

Spectrum requires RGB converter, £28.95

Metal box £19.95 extra

All models include inverse switch and TTL/Analogue switch suitable for other computers - Please ask  
COD or send your cheque to

CHROMAGRAPHICA, 135 Cliff Road, Hornsea, North Humberside HU15 1JB  
Telephone: 0428 881 065 (days) 04012 4699 (evenings)

TRADE ENQUIRIES WELCOME

NAME.....

ADDRESS.....

TELEPHONE..... COMPUTER.....

Please supply Chroma I £249.95 - £9.95 carriage. Converter (for Spectrum 48) £28.95 inc VAT. Sound £17.50 inc VAT

Colour.....

Wood

Metal

ZOP001

## FRONT PAGE SCOOP FRIDAY THE 13th

AVAILABLE FOR SPECTRUM, C64, AMSTRAD  
ONLY £3.95

## NEW FUTURE SOFTWARE

OUR PRICES ARE EVEN BETTER - NOW YOU CAN ORDER BY FREEPOST

### SPECTRUM

	OUR PRICE	AMSTRAD 480/800
JOHN BARRINGTON'S BOWLS	£3.95	£3.95
VIEW TO A KILL	£3.95	£3.95
IRISH LAND RACE	£3.95	£3.95
ATARI	£3.95	£3.95
TAPEN	£3.95	£3.95
PLUS 80 STOCK MANAGE	£4.95	£4.95
THE FIGHTING GENERATION	£6.95	£6.95
FLIGHT FROM DUBLIN	£8.95	£8.95
INTERNATIONAL KARATE	£8.95	£8.95
BORDERS & BOMBS (ROM) (special)	£8.95	£8.95
BOREDOM OF THE RINGS	£8.95	£8.95

### AMSTRAD

	OUR PRICE
MANHOLE	£3.95
ALIENS II	£3.95
HEATHROW ATC	£3.95
747 FLIGHT SIM	£3.95

### C64

	OUR PRICE
DEATH STALKERS	£3.95
DEATH STALKERS BACK	£3.95
BOBBY BIG STRIKE BACK	£3.95
FLASH IT, OUT IT TO HOLLYWOOD	£3.95
IMPERIAL PILOT	£3.95
STAFFORD KARATE	£3.95
FIGHTER PILOT (ROM INT)	£3.95

### ATARI

	OUR PRICE
TYCOON II	£3.95
DEATH OF A LADY	£3.95
KARON WARS	£3.95
PETALS OF DOOM	£3.95
SPIDERMAN	£3.95

### PCW

	OUR PRICE
AMERICAN FOOT	£4.95
ALIEN HUNTING POOL	£4.95
CENTRE COURT	£4.95
HEATHROW ATC	£4.95
RECHARGE	£4.95

This is just a small section of games on offer. Send now for our seven page catalogue S.A.E. please. BPPG & Overseas order add £1 P&P per order

ALL PRICES INC VAT & P.P.  
CHEQUES POSTAL ORDERS TO:

## NEW FUTURE SOFTWARE

FREEPOST (no stamp needed)

and send to: 4 Rowanburn, Fifehill, Dumfries, Scotland DG14 0RH  
AUTOMATIC FREE MEMBERSHIP TO NEW FUTURE SOFTWARE CLUB WITH FIRST ORDER  
OR CATALOGUE REQUEST... INCLUDES MONTHLY NEWSLETTER WITH LOTS OF SPECIAL  
OFFERS & DISCOUNTS

SOFTWARE PLEASE STATE 2ND CHOICE TO AVOID DISAPPOINTMENT  
TELEPHONE ORDERS ON (0615) 636 20/03/84

## C & F ASSOCIATES

### SPECIALLY

	OUR PRICE	AMSTRAD
COMMANDO	£3.95	£3.95
3 IN 1 FORCE HARRIER	£3.95	£3.95
MOON CRETE	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
BRIDGE TOEE	£3.95	£3.95
WORLD OF OLYMPICS	£3.95	£3.95
EXPLODING FIST	£3.95	£3.95
YIE KUNG FU	£3.95	£3.95
STEVE DAVID BROOKER	£3.95	£3.95
INDIA	£3.95	£3.95
PROJECT THESIS	£3.95	£3.95
SPEECH	£3.95	£3.95
CRIMEL	£3.95	£3.95
REFUGEE	£3.95	£3.95
SOUTHERN BELLE	£3.95	£3.95
COMPUTER KIDS (10) 2	£3.95	£3.95
JET JET	£3.95	£3.95
DRAG RACE	£3.95	£3.95
DAVID LEE	£3.95	£3.95
MINI OFFICE 2	£3.95	£3.95
ENTHAR	£3.95	£3.95
ROB CARMON	£3.95	£3.95
PROJECT THE 80'S	£3.95	£3.95
HYPER SPORTS	£3.95	£3.95
YIE KUNG FU	£3.95	£3.95
EXTRA POINT	£3.95	£3.95
OLYMPIC DECATHLON	£3.95	£3.95

	OUR PRICE	AMSTRAD
BUG EYES 2	£3.95	£3.95
JOHN BARRINGTON'S BOWLS	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
PROBE	£3.95	£3.95
REFUGEE	£3.95	£3.95
WORLD OF OLYMPICS	£3.95	£3.95
PROJECT THESIS	£3.95	£3.95
REFUGEE II	£3.95	£3.95
YIE KUNG FU (2 Disc)	£3.95	£3.95
DRAG RACE	£3.95	£3.95
EXTRA POINT	£3.95	£3.95
OLYMPIC DECATHLON	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
ELECTRON	£3.95	£3.95
COMBATARI	£3.95	£3.95
CITADEL	£3.95	£3.95
WIL A KUNG FU	£3.95	£3.95
THAI BOXING	£3.95	£3.95
PROJECT THESIS	£3.95	£3.95
REFUGEE	£3.95	£3.95
WORLD OF OLYMPICS	£3.95	£3.95
JET POWER JACK	£3.95	£3.95
Galactic Commander	£3.95	£3.95
Flight 1973	£3.95	£3.95
WORLD OF OLYMPICS (2 Disc)	£3.95	£3.95
DRAG RACE	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER	£3.95	£3.95
KARATE COMBAT	£3.95	£3.95
SMOKING SNOOKER	£3.95	£3.95
DAMBUSTERS	£3.95	£3.95

	OUR PRICE	AMSTRAD
POWERPLAY	£3.95	£3.95
GIRL'S NIGHT OUT	£3.95	£3.95
CITADEL	£3.95	£3.95
STRIKE FORCE HARRIER</		



## MAZE

by Dilwyn Jones

This program is a maze designer program which draws the maze on the screen using a moving green blob to show how the routine works and what routes it takes. You may like to use the `Make_A_Maze` procedure in your own programs.

The maze design algorithm is described first. Mazes generated have only one through path from the randomly generated entry point on the West side of the maze and the randomly generated exit point on the East side. There will, of course, be several random branches off the main route if the size of the maze is large enough and the dreaded Sinclair random number generator does its bit properly. These routes will all lead to dead ends because the routine only allows one through path. The maze is, therefore, realistic - as long as it is large enough.

The walls of the maze are bit mapped into the array *maze*. The width of the maze is specified by the variable *across* and the height of the maze by the variable *down*. A border of one element is required around the maze, hence the array is dimensioned using *DM* *maxdown* + 1, *across* + 1.

Bits 0 to 3 of each element represent openings or walls out of each square in the maze:

bit 0 set = opening to the North )      reset  
bit 1 set = opening to the East )      wall

bit 2 set = opening to the South ) in that  
bit 3 set = opening to the West ) direction  
The top left corner of the maze is  
maze(1,1) NW

The top right corner ■ the maze is  
maze(1,across) —NE

The bottom left corner of the maze is  
maze(down,1) —SW  
The bottom right corner of the maze is  
maze(down,across) —SE

The entry point is held in *inx* and *iny* and the exit point in *outx* and *outy*. The entrance is always on the West side and the exit always on the East side - *inx* will therefore always be 1 and *outx* will always be equal to *across*.

During creation of the maze, bits four and five of each element are used to denote visited points in the maze and points leading to dead ends (i.e., "can't return here" points) respectively. If bit four is set to one, it means that the routine has already visited that point and can return there if re-tracing its steps from a dead end.

When such a point is re-visited on return from a dead end, it is flagged as leading to a dead end so that the computer will not attempt to go there again, by resetting bits.

four and setting bit five

The program starts at the entrance and looks for unvisited points at random, but with a slight weighting towards certain directions so that it tends to tie itself in knots to create a more complex maze. The maze is initially all walls; a grid if you like. Once a suitable point to move to is found, an opening is created between the old square and the new square by setting the appropriate bits in *both* squares and (re)setting the appropriate *vis*/bits.

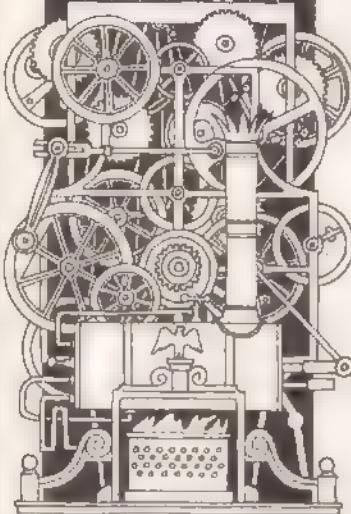
The routine looks all around the present square for an unvisited square. If none is found, this is a dead end and steps must be taken to retrace back to a suitable point. If all points surrounding the present square have bit five set, all points in the maze have been visited and the maze is complete.

The reason for the border around the maze is to create a no-go area around the maze so that the computer will not step outside the maze - this means that no edge detection is necessary

Next week, we'll be using these principles in a 3-D maze type game. Meanwhile, if you'd like copies of both programs, send £2.50, plus a formatted microdrive or 3½" floppy disc (5½" or 3½") to: Dilwyn Jones, 4 The Crescent, Bangor, Gwynedd LL57 2AA.

100 REMARK maze done, 1, draw & write 2,0  
100 maze WHILE designing it  
110 REMARK by Dilwyn Jones,  
110 MODE 16:WINDOW 517,750,8,8;PAPER 8;CLEAR  
120 REMARK works in mode 4 or 8  
130 WINDOW 448,288,32,16;PAPER 2;INK 7;COL  
140 SIZE 2,8;CLRS 8  
150 REMARK size of maze  
150 across=38:down=16:PRINT #9, "Please wait -  
150 - designing the maze..."  
150 REMARK A\_MAZE=CLRS 8  
170 DEFKEY PROCEDURE A\_MAZE  
170 DIM maze(16,1,across+1)  
190 (inviting)=RD1 TD down  
200 (exit)=RD2 TD down  
210 (entrance)=RD3 TD down  
210 (empty)=RD4 TD down  
220 outy=RD5 TD down?outx=across:REM  
220 exit  
230 REMARK creates no exit border  
240 FOR acx=1 TO across:session(8,9)=52:session  
240 :idown=1:acx=32  
250 FOR dnx=1 TO down:session(0,8)=32:session  
250 :dn,acx)=32  
260 REMARK eat entrance, exit bits and  
260 draw openings  
270 maze(inv,inv)=open(inv,inv):180:BLOCK  
270 2,18,14,11,11,1,2:REM mark west entry  
280 maze(inv,inv)=outy:outx=across,down  
280 0,18,14,11,11,1,2:REM mark east exit  
290 REMARK arrow at entrance then wait  
290 CURSOR 2,11,y=1:PRINT CHR\$(109):  
290 USR 32,14:acx=2,2,11,y=1:PRINT CHR\$(89)  
310 REMARK outer  
320 BLOCK 12,18,14\*x+2,11\*y+1,4:PAUSE  
320 :REMARK prints "blob"

00010-25



## COLOUR CODES

by Peter Graves

**A**l electronics engineers have to learn the colour codes used on resistors to denote their value. The program below gives how-to instructions and practice in reading the value of resistors using three coloured bands.

Resistor values can be indicated in steps of one ohm by using three bands. However, they are not supplied in all possible values but in steps of values known as preferred values. Thus, you can buy a 100 ohm resistor or a 120 ohm resistor but not (except to special order) a 107 ohm resistor. There are several sets of preferred values, the most common has been used starting off 10, 12, 15 . . . ohms. The range of values cov-

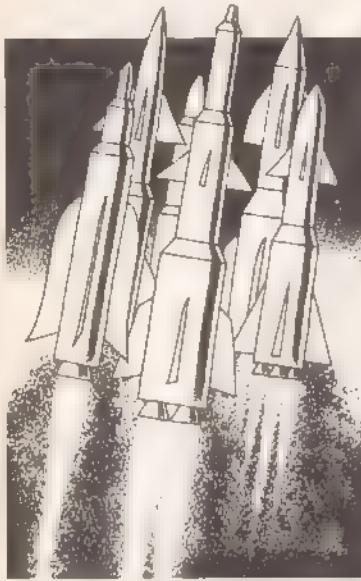
ered in the program is between 10 ohms and 10 Megohms. A short set of instructions with an example is given in the program.

Programming note: To make the instruction pages easier to read, the display is switched into the lower case mode (exactly as if the Shift and Commodore keys had been pressed together). This gives an odd appearance to the program listing in the upper case mode - capital letters appear as the graphics character obtained if the shift key and that letter are pressed.

Rem statements have been added to the appropriate lines, but, of course, these can be omitted when typing in the program.

# PLANETS POSITIONS

by David Webber



This week, your final helping of listing for our Astronomy program, which will calculate the positions of the planets, and graphically display them up against the background of constellations.

As an aid to de-bugging, we've found that the most common error is confusing

lower case 'l's with the number one - so if you get an unexpected syntax error on entering a line, check for this first.

For the faint hearted, tape copies are available from David Webber, at a price of £2.50. Write to him at Cummel Fayle, Ballateron, Ballaugh, Isle of Man.

```

3700 REM
3710 REM FROM ECLIPTIC TO EQUATORIAL CO-ORDS
3720 REM
3730 REM
3740 REM t=yr
3750 REM ec=23.43
3760 REM (1+BIN(b1)*COS(1ec))+(COS(b)*BIN(ec)*SIN(1ec))
3770 REM
3780 DEF FNt(x)=SQR(1+SQR(-x*x+1))
3790 DEF FNb(d1)
3791 DEF INT(d1)=INT((d1-0.5)+0.5)
3800 REM t1=INT(t1)/INT((1+BIN(b1))+(COS(b)*BIN(ec)))
3810 REM t1=ATN(b1)
3820 IF t1<0 THEN t1=t1+360
3830 IF t1>360 THEN t1=t1-360
3840 IF t1<0 THEN t1=t1+360
3850 t1=INT(t1/15)+2=(INT(t1/15)+1)+60
3860 RETURN
3900 REM
3910 REM SCREEN FORMAT
3920 REM
3930 REM 80,24
3940 PRINT USING #1,149.5;
3950 PRINT TAB(44)*USING "#00.***.thi";
3960 PRINT USING "#0.***.thi";
3970 PRINT TAB(44)*USING "#00.***.thi";
3980 PRINT USING "#0.***.thi";
3990 RETURN
4000 REM
4010 REM ST AR CHART 1
4020 REM
4030 BORDER 0:INK 1,24:INK 0,0
4040 GOSUB 5000
4050 REM t=0
4060 FOR i=36 TO 420 STEP 60:MOVE #37:y=y-11
PRINT y1:NEAT
4070 REM 42.17*PRINT"Right Ascension - hours
Date "-1" 101"/"101"/"y1
4080 GOSUB 6000
4090 FOR i=1 TO 201:READ a,b:PL01,a,b:NEAT x
4100 DATA 85,370,95,338,61,308,60,295,88,258,
4110 DATA 64,243,63,235,60,234,52,109,52,87,6
4120 DATA 92,62,99,60,225,367,227,376,278,382
4130 DATA 175,353,215,320,120,333,121,319,145
4140 DATA 162,304,185,285,195,302
4150 MOVE i470,171:PRINT"Press for next chart":1
:TAPOFF
4160 REM 10KEY*** GOTO 4510
4170 REM
4180 REM 225,305,307,285,315,295,318,308,322
4190 DATA 249,257,226,250,257,246
4200 DATA 252,218,246,215,242,212,235,180,272
4210 DATA 331,192,304,95,126,181,153,218,310,
4220 DATA 100,317,862,325,84,177,230
4230 DATA 200,238,195,190,211,193,112,120,150
4240 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4250 REM
4260 REM 225,305,307,285,315,295,318,308,322
4270 DATA 249,257,226,250,257,246
4280 DATA 252,218,246,215,242,212,235,180,272
4290 DATA 331,192,304,95,126,181,153,218,310
4300 DATA 100,317,862,325,84,177,230
4310 DATA 200,238,195,190,211,193,112,120,150
4320 DATA 249,257,226,250,257,246
4330 DATA 252,218,246,215,242,212,235,180,272
4340 DATA 331,192,304,95,126,181,153,218,310
4350 DATA 100,317,862,325,84,177,230
4360 DATA 200,238,195,190,211,193,112,120,150
4370 DATA 249,257,226,250,257,246
4380 DATA 252,218,246,215,242,212,235,180,272
4390 DATA 331,192,304,95,126,181,153,218,310
4400 DATA 100,317,862,325,84,177,230
4410 DATA 200,238,195,190,211,193,112,120,150
4420 DATA 249,257,226,250,257,246
4430 DATA 252,218,246,215,242,212,235,180,272
4440 DATA 331,192,304,95,126,181,153,218,310
4450 DATA 100,317,862,325,84,177,230
4460 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4470 REM 10KEY*** GOTO 4510
4480 REM
4490 REM 225,305,307,285,315,295,318,308,322
4500 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4510 REM
4520 REM
4530 REM 225,305,307,285,315,295,318,308,322
4540 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4550 REM
4560 REM 225,305,307,285,315,295,318,308,322
4570 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4580 REM
4590 REM 225,305,307,285,315,295,318,308,322
4600 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4610 REM
4620 REM
4630 REM 225,305,307,285,315,295,318,308,322
4640 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4650 REM
4660 REM 225,305,307,285,315,295,318,308,322
4670 MOVE i470,200:PRINT"Press for next chart":1
:TAPOFF
4680 MOVE #37:y=y-1:PRINT#1
4690 MOVE 47,17:PRINT"Right Ascension - hours
Date "-1" 101"/"101"/"y1
4700 BOSUB 6000
4710 FOR i=1 TO 178:READ a,b:PL01,a,b:NEAT x
4720 DATA 92,297,68,388,60,372,62,344,73,308,
81,279,49,298,51,242
4730 DATA 73,250,85,202,90,206,77,187,68,178,
75,155,75,155,70,108
4740 DATA 59,83,54,99,50,50,183,275,183,283,1
78,286,173,297,178,330
4750 DATA 149,352,162,380,192,372,192,341,208
267,230,293,238,290,233,282
4760 DATA 287,372,306,383,100,338,105,330,118
323,122,330,130,328,131,333
4770 DATA 132,345,112,305,123,300,116,292,108
382,118,280,132,262,121,247
4780 DATA 114,239,116,205,273,292,270,332,315
335,262,263,289,254,246,219
4790 DATA 258,175,275,197,302,215,322,216,131
159,145,161,173,155,162,119
4800 DATA 312,184,320,150,335,150,335,120,306
125,172,102,215,12,252,129
4810 DATA 223,129,233,129,194,150,196,115,109
102,190,22,218,74,263,72
4820 DATA 142,41,131,53,105,66,112,85,127,81,
79,145,75,142,72
4830 DATA 145,57,169,48,295,395,412,380,442,3
453,450,390,365,335,307,368
4840 DATA 519,572,520,387,363,392,412,355,437
343,457,360,492,385,355,378
4850 DATA 372,305,403,302,446,302,450,310,372
327,478,322,282,540,353,542,308,540,292,528
248,570,255,435,219,455,220
4870 DATA 472,169,536,246,534,245,547,243,546
235,540,234,530,245,510,230
4880 DATA 463,219,482,472,472,161,459,170,453
172,438,159,426,155,415,158
4890 DATA 289,112,400,112,372,495,350,87,368,1
82,380,179,387,182,406,151
4900 DATA 380,152,382,150,380,150,348,153,374
132,408,72,435,75,492,76
4910 DATA 533,110,539,87,343,78,448,31,492,58
355,46,574,202,575,129
4920 DATA 578,81,608,347,597,333,599,319,622,
308,639,322,608,328,615,331
4930 DATA 605,245,615,255,602,182,630,150,348,
119,223,72,621,74,612,46
4940 DATA 603,68,628,42
4950 DATA
4960 DATA 225,305,307,285,315,295,318,308,322
4970 DATA 249,257,226,250,257,246
4980 DATA 252,218,246,215,242,212,235,180,272
4990 DATA 331,192,304,95,126,181,153,218,310
5010 DATA 100,317,862,325,84,177,230
5020 DATA 200,238,195,190,211,193,112,120,150
5030 DATA 249,257,226,250,257,246
5040 DATA 252,218,246,215,242,212,235,180,272
5050 DATA 331,192,304,95,126,181,153,218,310
5060 DATA 100,317,862,325,84,177,230
5070 DATA 200,238,195,190,211,193,112,120,150
5080 DATA 249,257,226,250,257,246
5090 DATA 252,218,246,215,242,212,235,180,272
5100 DATA 331,192,304,95,126,181,153,218,310
5110 DATA 100,317,862,325,84,177,230
5120 DATA 200,238,195,190,211,193,112,120,150
5130 DATA 249,257,226,250,257,246
5140 DATA 252,218,246,215,242,212,235,180,272
5150 DATA 331,192,304,95,126,181,153,218,310
5160 DATA 100,317,862,325,84,177,230
5170 DATA 200,238,195,190,211,193,112,120,150
5180 DATA 249,257,226,250,257,246
5190 DATA 252,218,246,215,242,212,235,180,272
5200 DATA 331,192,304,95,126,181,153,218,310
5210 DATA 100,317,862,325,84,177,230
5220 DATA 200,238,195,190,211,193,112,120,150
5230 DATA 249,257,226,250,257,246
5240 DATA 252,218,246,215,242,212,235,180,272
5250 DATA 331,192,304,95,126,181,153,218,310
5260 DATA 100,317,862,325,84,177,230
5270 DATA 200,238,195,190,211,193,112,120,150
5280 DATA 249,257,226,250,257,246
5290 DATA 252,218,246,215,242,212,235,180,272
5300 DATA 331,192,304,95,126,181,153,218,310
5310 DATA 100,317,862,325,84,177,230
5320 DATA 200,238,195,190,211,193,112,120,150
5330 DATA 249,257,226,250,257,246
5340 DATA 252,218,246,215,242,212,235,180,272
5350 DATA 331,192,304,95,126,181,153,218,310
5360 DATA 100,317,862,325,84,177,230
5370 DATA 200,238,195,190,211,193,112,120,150
5380 DATA 249,257,226,250,257,246
5390 DATA 252,218,246,215,242,212,235,180,272
5400 DATA 331,192,304,95,126,181,153,218,310
5410 DATA 100,317,862,325,84,177,230
5420 DATA 200,238,195,190,211,193,112,120,150
5430 DATA 249,257,226,250,257,246
5440 DATA 252,218,246,215,242,212,235,180,272
5450 DATA 331,192,304,95,126,181,153,218,310
5460 DATA 100,317,862,325,84,177,230
5470 DATA 200,238,195,190,211,193,112,120,150
5480 DATA 249,257,226,250,257,246
5490 DATA 252,218,246,215,242,212,235,180,272
5500 DATA 331,192,304,95,126,181,153,218,310
5510 DATA 100,317,862,325,84,177,230
5520 DATA 200,238,195,190,211,193,112,120,150
5530 DATA 249,257,226,250,257,246
5540 DATA 252,218,246,215,242,212,235,180,272
5550 DATA 331,192,304,95,126,181,153,218,310
5560 DATA 100,317,862,325,84,177,230
5570 DATA 200,238,195,190,211,193,112,120,150
5580 DATA 249,257,226,250,257,246
5590 DATA 252,218,246,215,242,212,235,180,272
5600 DATA 331,192,304,95,126,181,153,218,310
5610 DATA 100,317,862,325,84,177,230
5620 DATA 200,238,195,190,211,193,112,120,150
5630 DATA 249,257,226,250,257,246
5640 DATA 252,218,246,215,242,212,235,180,272
5650 DATA 331,192,304,95,126,181,153,218,310
5660 DATA 100,317,862,325,84,177,230
5670 DATA 200,238,195,190,211,193,112,120,150
5680 DATA 249,257,226,250,257,246
5690 DATA 252,218,246,215,242,212,235,180,272
5700 DATA 331,192,304,95,126,181,153,218,310
5710 DATA 100,317,862,325,84,177,230
5720 DATA 200,238,195,190,211,193,112,120,150
5730 DATA 249,257,226,250,257,246
5740 DATA 252,218,246,215,242,212,235,180,272
5750 DATA 331,192,304,95,126,181,153,218,310
5760 DATA 100,317,862,325,84,177,230
5770 DATA 200,238,195,190,211,193,112,120,150
5780 DATA 249,257,226,250,257,246
5790 DATA 252,218,246,215,242,212,235,180,272
5800 DATA 331,192,304,95,126,181,153,218,310
5810 DATA 100,317,862,325,84,177,230
5820 DATA 200,238,195,190,211,193,112,120,150
5830 DATA 249,257,226,250,257,246
5840 DATA 252,218,246,215,242,212,235,180,272
5850 DATA 331,192,304,95,126,181,153,218,310
5860 DATA 100,317,862,325,84,177,230
5870 DATA 200,238,195,190,211,193,112,120,150
5880 DATA 249,257,226,250,257,246
5890 DATA 252,218,246,215,242,212,235,180,272
5900 DATA 331,192,304,95,126,181,153,218,310
5910 DATA 100,317,862,325,84,177,230
5920 DATA 200,238,195,190,211,193,112,120,150
5930 DATA 249,257,226,250,257,246
5940 DATA 252,218,246,215,242,212,235,180,272
5950 DATA 331,192,304,95,126,181,153,218,310
5960 DATA 100,317,862,325,84,177,230
5970 DATA 200,238,195,190,211,193,112,120,150
5980 DATA 249,257,226,250,257,246
5990 DATA 252,218,246,215,242,212,235,180,272
6000 DATA 331,192,304,95,126,181,153,218,310
6010 DATA 100,317,862,325,84,177,230
6020 DATA 200,238,195,190,211,193,112,120,150
6030 DATA 249,257,226,250,257,246
6040 DATA 252,218,246,215,242,212,235,180,272
6050 DATA 331,192,304,95,126,181,153,218,310
6060 DATA 100,317,862,325,84,177,230
6070 DATA 200,238,195,190,211,193,112,120,150
6080 DATA 249,257,226,250,257,246
6090 DATA 252,218,246,215,242,212,235,180,272
6100 DATA 331,192,304,95,126,181,153,218,310
6110 DATA 100,317,862,325,84,177,230
6120 DATA 200,238,195,190,211,193,112,120,150
6130 DATA 249,257,226,250,257,246
6140 DATA 252,218,246,215,242,212,235,180,272
6150 DATA 331,192,304,95,126,181,153,218,310
6160 DATA 100,317,862,325,84,177,230
6170 DATA 200,238,195,190,211,193,112,120,150
6180 DATA 249,257,226,250,257,246
6190 DATA 252,218,246,215,242,212,235,180,272
6200 DATA 331,192,304,95,126,181,153,218,310
6210 DATA 100,317,862,325,84,177,230
6220 DATA 200,238,195,190,211,193,112,120,150
6230 DATA 249,257,226,250,257,246
6240 DATA 252,218,246,215,242,212,235,180,272
6250 DATA 331,192,304,95,126,181,153,218,310
6260 DATA 100,317,862,325,84,177,230
6270 DATA 200,238,195,190,211,193,112,120,150
6280 DATA 249,257,226,250,257,246
6290 DATA 252,218,246,215,242,212,235,180,272
6300 DATA 331,192,304,95,126,181,153,218,310
6310 DATA 100,317,862,325,84,177,230
6320 DATA 200,238,195,190,211,193,112,120,150
6330 DATA 249,257,226,250,257,246
6340 DATA 252,218,246,215,242,212,235,180,272
6350 DATA 331,192,304,95,126,181,153,218,310
6360 DATA 100,317,862,325,84,177,230
6370 DATA 200,238,195,190,211,193,112,120,150
6380 DATA 249,257,226,250,257,246
6390 DATA 252,218,246,215,242,212,235,180,272
6400 DATA 331,192,304,95,126,181,153,218,310
6410 DATA 100,317,862,325,84,177,230
6420 DATA 200,238,195,190,211,193,112,120,150
6430 DATA 249,257,226,250,257,246
6440 DATA 252,218,246,215,242,212,235,180,272
6450 DATA 331,192,304,95,126,181,153,218,310
6460 DATA 100,317,862,325,84,177,230
6470 DATA 200,238,195,190,211,193,112,120,150
6480 DATA 249,257,226,250,257,246
6490 DATA 252,218,246,215,242,212,235,180,272
6500 DATA 331,192,304,95,126,181,153,218,310
6510 DATA 100,317,862,325,84,177,230
6520 DATA 200,238,195,190,211,193,112,120,150
6530 DATA 249,257,226,250,257,246
6540 DATA 252,218,246,215,242,212,235,180,272
6550 DATA 331,192,304,95,126,181,153,218,310
6560 DATA 100,317,862,325,84,177,230
6570 DATA 200,238,195,190,211,193,112,120,150
6580 DATA 249,257,226,250,257,246
6590 DATA 252,218,246,215,242,212,235,180,272
6600 DATA 331,192,304,95,126,181,153,218,310
6610 DATA 100,317,862,325,84,177,230
6620 DATA 200,238,195,190,211,193,112,120,150
6630 DATA 249,257,226,250,257,246
6640 DATA 252,218,246,215,242,212,235,180,272
6650 DATA 331,192,304,95,126,181,153,218,310
6660 DATA 100,317,862,325,84,177,230
6670 DATA 200,238,195,190,211,193,112,120,150
6680 DATA 249,257,226,250,257,246
6690 DATA 252,218,246,215,242,212,235,180,272
6700 DATA 331,192,304,95,126,181,153,218,310
6710 DATA 100,317,862,325,84,177,230
6720 DATA 200,238,195,190,211,193,112,120,150
6730 DATA 249,257,226,250,257,246
6740 DATA 252,218,246,215,242,212,235,180,272
6750 DATA 331,192,304,95,126,181,153,218,310
6760 DATA 100,317,862,325,84,177,230
6770 DATA 200,238,195,190,211,193,112,120,150
6780 DATA 249,257,226,250,257,246
6790 DATA 252,218,246,215,242,212,235,180,272
6800 DATA 331,192,304,95,126,181,153,218,310
6810 DATA 100,317,862,325,84,177,230
6820 DATA 200,238,195,190,211,193,112,120,150
6830 DATA 249,257,226,250,257,246
6840 DATA 252,218,246,215,242,212,235,180,272
6850 DATA 331,192,304,95,126,181,153,218,310
6860 DATA 100,317,862,325,84,177,230
6870 DATA 200,238,195,190,211,193,112,120,150
6880 DATA 249,257,226,250,257,246
6890 DATA 252,218,246,215,242,212,235,180,272
6900 DATA 331,192,304,95,126,181,153,218,310
6910 DATA 100,317,862,325,84,177,230
6920 DATA 200,238,195,190,211,193,112,120,150
6930 DATA 249,257,226,250,257,246
6940 DATA 252,218,246,215,242,212,235,180,272
6950 DATA 331,192,304,95,126,181,153,218,310
6960 DATA 100,317,862,325,84,177,230
6970 DATA 200,238,195,190,211,193,112,120,150
6980 DATA 249,257,226,250,257,246
6990 DATA 252,218,246,215,242,212,235,180,272
7000 DATA 331,192,304,95,126,181,153,218,310
7010 DATA 100,317,862,325,84,177,230
7020 DATA 200,238,195,190,211,193,112,120,150
7030 DATA 249,257,226,250,257,246
7040 DATA 252,218,246,215,242,212,235,180,272
7050 DATA 331,192,304,95,126,181,153,218,310
7060 DATA 100,317,862,325,84,177,230
7070 DATA 200,238,195,190,211,193,112,120,150
7080 DATA 249,257,226,2
```

# Programming: Amstrad

```

5030 rem t:dec=d:j:60SUB 5050:PRINT"";
5040 rem t:k:dec=d:j:60SUB 5050:PRINT"PT":GOTO 5
970
5050 rem t:360-rs)=4+100:dec=d:ec4+220
5060 IF rs=360 AND rs=1000 THEN rem=480 E
LSE rem=100
5070 MOVE ra,dec
5080 RETURN
5090 MOVE 470,17:PRINT"Press for next chart";
:TADEOFF
5100 IF INKEY="" GOTO 5100
5100 REM
5110 REM STAR CHART 3
5120 REM
5130 CLS:60SUB 5800
5140 y*24
5150 FOR y=152 TO 620 STEP 60:MOVE z,37iy=y-1
:PRINT z:NEST
5160 MOVE 47,17:PRINT"Right Ascension - hours
- Date -l" "l0s" "100" "y11
5170 MOVE 3b,37:PRINT l1:MOVE 9b,37:PRINT 01

5200 GOSUB 6000
5210 FOR i= 2361READ a,b:PLT a,b:NEST x
5220 DATA 53,378,62,340,93,333,90,278,55,250,
60,145,77,60,78,43
5230 DATA 195,388,213,372,210,367,182,330,184
,330,215,350,178,310,180,315
5240 DATA 210,321,232,323,241,323,161,278,180
,267,186,262,242,257,215,245
5250 DATA 272,237,275,259,264,246,268,240,287
,237,295,281,305,300,275
5260 DATA 308,273,310,274,310,270,311,261,308
,258,302,397,321,378,352
5270 DATA 270,339,328,330,107,247,128,242,138
,145,149,241,150,232,182,233
5280 DATA 140,225,125,227,332,215,198,222,190
,217,193,218,297,160,275,173
5290 DATA 251,195,218,218,202,213,208,187,216
,161,171,167,175,162,170,153
5300 DATA 158,135,143,138,124,160,239,152,244
,232,250,140,250,130,260,128
5310 DATA 280,118,293,110,299,113,282,139,263
,131,281,149,317,147,325,158

5400 DATA 328,168,330,170,326,166,267,70,285,
90,295,82,265,55,290,43
5410 DATA 170,100,187,110,240,85,218,85,192,8
7,174,85,170,87,115,105
5420 DATA 148,87,134,87,126,232,70,219,80,210,53,
208,80,195,42,195,45
5430 DATA 341,330,350,317,378,319,390,307,428
,372,419,367,410,364,407,348
5440 DATA 415,330,358,336,340,372,508,363,498
,367,465,368,342,345,322,342
5450 DATA 306,322,492,529,475,352,445,337,354
,308,560,298,509,277,360,398
5460 DATA 344,355,367,340,373,331,358,262,355
,235,348,248,406,378,399,273
5470 DATA 380,232,352,222,398,198,343,298,357
,293,365,290,362,287,418,200
5480 DATA 430,188,412,157,436,180,530,261,526
,357,468,270,479,239,475,232
5490 DATA 462,234,465,180,442,208,408,237,497
,238,532,229,570,205,565,200
5500 DATA 531,185,528,178,552,182,513,157,502
,120,487,158,570,100,578,175
5510 DATA 578,140,562,118,533,113,548,107,534
,82,530,70,527,51,511,47
5520 DATA 487,50,475,60,480,65,490,72,472,72,
5530 DATA 154,385,147,379,142
5540 DATA 387,134,304,132,412,112,420,110,438
,118,452,138,445,100,460,97
5550 DATA 442,87,450,72,584,42,382,58,407,100
,198,107,392,117,382,120
5560 DATA 372,118,345,114,359,112,347,110,638
,380,622,352,580,338,582,336
5570 DATA 392,327,358,328,608,328,612,335,609
,354,390,263,800,278,573,492
5580 DATA 584,287,595,280,604,280,598,247,592
,238,595,203,622,190,609,160
5590 DATA 585,128,566,115,588,102,620,42,608,
56,585,66,592,65,602,81
5600 DATA 600,80,610,79,616,73,617,38
5610 DATA 640,140,650,130,660,120,670,110
5620 TAD
5630 rem t:dec=d:j:60SUB 5700:PRINT"";
5640 rem t:k:dec=d:j:60SUB 5700:PRINT"";
5650 rem t:f:dec=d:j:60SUB 5700:PRINT"";
5660 rem t:g:dec=d:j:60SUB 5700:PRINT"";
5670 rem t:h:dec=d:j:60SUB 5700:PRINT"";
5680 rem t:i:dec=d:j:60SUB 5700:PRINT"";
5690 rem t:k:dec=d:j:60SUB 5700:PRINT"";
5700 rem t:360-rai=4+100:dec=d:ec4+220
5710 IF rem=100 AND rem=360 THEN rem=0 ELSE
rem=100
5720 MOVE ra,dec
5730 RETURN
5740 MOVE 470,17:PRINT"Press for new date";
:TADEOFF
5750 WHILE INKEY="" WEND:CLS:BORDER 1:B:INK 1
,0:INK 0:1,BRIN 400
5800 REM
5810 REM 0 A R M F R A M E
5820 REM
5830 PL01 0,0
5840 DRAW 0,399
5850 DRAW 639,399
5860 DRAW 639,0
5870 DRAW 0,0
5880 MOVE 47,401:DRAW 47,399
5890 MOVE 0,401:DRAW 639,40
5900 MOVE 47,220:DRAW 639,220
5910 TAB
5920 RETURN
5930 REM
5940 REM DECLINATION DEG.
5950 REM
5960 z=+50
5970 FOR c=68 TO 390 STEP 40
5980 MOVE z,c
5990 rem=40
6000 rem=40
6010 PRINT z
6020 REM
6030 rem=50
6040 FOR c=68 TO 390 STEP 40
6050 MOVE z,c
6060 rem=40
6070 PRINT z
6080 REM
6090 TABOFF
6100 FOR x=111 TO 15
6110 LOCALE 2,1x$3
6120 a$="Declination deg"
6130 PRINT MID(a$,1,111,111)
6140 NEXT
6150 RETURN

```

# Programming: Atari ST



# PAINTER

by Bruce Pople

**A**rt-100 is designed to run on the Atari ST-520 with a black and white monitor. It is an on screen painting program where impressive results can be obtained very quickly.

The program is controlled by the mouse and no key depressions are needed while

drawing. It also makes good use of the GEM routines which are accessible from Basic, especially the one which removes GEM's control over the program. By turning GEM off, running speed is greatly increased.

Before typing in anything though, more

memory is needed, so the graphics buffer must be switched off. If you do not know how to do this read the Errata sheet at the back of the ST Basic manual.

The program allows filled circles and ellipses, as well as boxes and lines. You are also given a selection of shaded pat-

```

10 on error goto 4000
20 rem 30s=40*dec=113:Sk=1:k=60t=50
30 rem qpm=dec=21:k=113:Sk=1:k=60t=50
40 rem 60SUB BCSET
50 rem 60SUB RDXB
60 rem 60SUB CTES!
70 rem gosub ini
80 rem gosub rdi
90 rem gosub hti
100 rem gosub ltest
110 rem mainmenu control
120 rem a$=gb
130 rem potc systab=24,1
140 rem gosub = gosub 1a$=12
150 rem a$=ays 791
160 rem p=peak (aintout <2)
170 rem p=peak (aintout >4-34
180 rem p=peak (aintout >6)

1000 error trap
1010 set variables
1020 set up
1030 screen
1040 *
1050 *
1060 *
1070 *
1080 *
1090 *
1100 *
1110 *
1120 *
1130 *
1140 *
1150 *
1160 *
1170 *
1180 *
1190 *
1200 *
1210 *
1220 *
1230 *
1240 *
1250 *
1260 *
1270 *
1280 *
1290 *
1300 *
1310 *
1320 *
1330 *
1340 *
1350 *
1360 *
1370 *
1380 *
1390 *
1400 *
1410 *
1420 *
1430 *
1440 *
1450 *
1460 *
1470 *
1480 *
1490 *
1500 *
1510 *
1520 *
1530 *
1540 *
1550 *
1560 *
1570 *
1580 *
1590 *
1600 *
1610 *
1620 *
1630 *
1640 *
1650 *
1660 *
1670 *
1680 *
1690 *
1700 *
1710 *
1720 *
1730 *
1740 *
1750 *
1760 *
1770 *
1780 *
1790 *
1800 *
1810 *
1820 *
1830 *
1840 *
1850 *
1860 *
1870 *
1880 *
1890 *
1900 *
1910 *
1920 *
1930 *
1940 *
1950 *
1960 *
1970 *
1980 *
1990 *
2000 *
2010 *
2020 *
2030 *
2040 *
2050 *
2060 *
2070 *
2080 *
2090 *
2100 *
2110 *
2120 *
2130 *
2140 *
2150 *
2160 *
2170 *
2180 *
2190 *
2200 *
2210 *
2220 *
2230 *
2240 *
2250 *
2260 *
2270 *
2280 *
2290 *
2300 *
2310 *
2320 *
2330 *
2340 *
2350 *
2360 *
2370 *
2380 *
2390 *
2400 *
2410 *
2420 *
2430 *
2440 *
2450 *
2460 *
2470 *
2480 *
2490 *
2500 *
2510 *
2520 *
2530 *
2540 *
2550 *
2560 *
2570 *
2580 *
2590 *
2600 *
2610 *
2620 *
2630 *
2640 *
2650 *
2660 *
2670 *
2680 *
2690 *
2700 *
2710 *
2720 *
2730 *
2740 *
2750 *
2760 *
2770 *
2780 *
2790 *
2800 *
2810 *
2820 *
2830 *
2840 *
2850 *
2860 *
2870 *
2880 *
2890 *
2900 *
2910 *
2920 *
2930 *
2940 *
2950 *
2960 *
2970 *
2980 *
2990 *
3000 *
3010 *
3020 *
3030 *
3040 *
3050 *
3060 *
3070 *
3080 *
3090 *
3100 *
3110 *
3120 *
3130 *
3140 *
3150 *
3160 *
3170 *
3180 *
3190 *
3200 *
3210 *
3220 *
3230 *
3240 *
3250 *
3260 *
3270 *
3280 *
3290 *
3300 *
3310 *
3320 *
3330 *
3340 *
3350 *
3360 *
3370 *
3380 *
3390 *
3400 *
3410 *
3420 *
3430 *
3440 *
3450 *
3460 *
3470 *
3480 *
3490 *
3500 *
3510 *
3520 *
3530 *
3540 *
3550 *
3560 *
3570 *
3580 *
3590 *
3600 *
3610 *
3620 *
3630 *
3640 *
3650 *
3660 *
3670 *
3680 *
3690 *
3700 *
3710 *
3720 *
3730 *
3740 *
3750 *
3760 *
3770 *
3780 *
3790 *
3800 *
3810 *
3820 *
3830 *
3840 *
3850 *
3860 *
3870 *
3880 *
3890 *
3900 *
3910 *
3920 *
3930 *
3940 *
3950 *
3960 *
3970 *
3980 *
3990 *
4000 *
4010 *
4020 *
4030 *
4040 *
4050 *
4060 *
4070 *
4080 *
4090 *
4100 *
4110 *
4120 *
4130 *
4140 *
4150 *
4160 *
4170 *
4180 *
4190 *
4200 *
4210 *
4220 *
4230 *
4240 *
4250 *
4260 *
4270 *
4280 *
4290 *
4300 *
4310 *
4320 *
4330 *
4340 *
4350 *
4360 *
4370 *
4380 *
4390 *
4400 *
4410 *
4420 *
4430 *
4440 *
4450 *
4460 *
4470 *
4480 *
4490 *
4500 *
4510 *
4520 *
4530 *
4540 *
4550 *
4560 *
4570 *
4580 *
4590 *
4600 *
4610 *
4620 *
4630 *
4640 *
4650 *
4660 *
4670 *
4680 *
4690 *
4700 *
4710 *
4720 *
4730 *
4740 *
4750 *
4760 *
4770 *
4780 *
4790 *
4800 *
4810 *
4820 *
4830 *
4840 *
4850 *
4860 *
4870 *
4880 *
4890 *
4900 *
4910 *
4920 *
4930 *
4940 *
4950 *
4960 *
4970 *
4980 *
4990 *
5000 *
5010 *
5020 *
5030 *
5040 *
5050 *
5060 *
5070 *
5080 *
5090 *
5100 *
5110 *
5120 *
5130 *
5140 *
5150 *
5160 *
5170 *
5180 *
5190 *
5200 *
5210 *
5220 *
5230 *
5240 *
5250 *
5260 *
5270 *
5280 *
5290 *
5300 *
5310 *
5320 *
5330 *
5340 *
5350 *
5360 *
5370 *
5380 *
5390 *
5400 *
5410 *
5420 *
5430 *
5440 *
5450 *
5460 *
5470 *
5480 *
5490 *
5500 *
5510 *
5520 *
5530 *
5540 *
5550 *
5560 *
5570 *
5580 *
5590 *
5600 *
5610 *
5620 *
5630 *
5640 *
5650 *
5660 *
5670 *
5680 *
5690 *
5700 *
5710 *
5720 *
5730 *
5740 *
5750 *
5760 *
5770 *
5780 *
5790 *
5800 *
5810 *
5820 *
5830 *
5840 *
5850 *
5860 *
5870 *
5880 *
5890 *
5900 *
5910 *
5920 *
5930 *
5940 *
5950 *
5960 *
5970 *
5980 *
5990 *
6000 *
6010 *
6020 *
6030 *
6040 *
6050 *
6060 *
6070 *
6080 *
6090 *
6100 *
6110 *
6120 *
6130 *
6140 *
6150 *
6160 *
6170 *
6180 *
6190 *
6200 *
6210 *
6220 *
6230 *
6240 *
6250 *
6260 *
6270 *
6280 *
6290 *
6300 *
6310 *
6320 *
6330 *
6340 *
6350 *
6360 *
6370 *
6380 *
6390 *
6400 *
6410 *
6420 *
6430 *
6440 *
6450 *
6460 *
6470 *
6480 *
6490 *
6500 *
6510 *
6520 *
6530 *
6540 *
6550 *
6560 *
6570 *
6580 *
6590 *
6600 *
6610 *
6620 *
6630 *
6640 *
6650 *
6660 *
6670 *
6680 *
6690 *
6700 *
6710 *
6720 *
6730 *
6740 *
6750 *
6760 *
6770 *
6780 *
6790 *
6800 *
6810 *
6820 *
6830 *
6840 *
6850 *
6860 *
6870 *
6880 *
6890 *
6900 *
6910 *
6920 *
6930 *
6940 *
6950 *
6960 *
6970 *
6980 *
6990 *
7000 *
7010 *
7020 *
7030 *
7040 *
7050 *
7060 *
7070 *
7080 *
7090 *
7100 *
7110 *
7120 *
7130 *
7140 *
7150 *
7160 *
7170 *
7180 *
7190 *
7200 *
7210 *
7220 *
7230 *
7240 *
7250 *
7260 *
7270 *
7280 *
7290 *
7300 *
7310 *
7320 *
7330 *
7340 *
7350 *
7360 *
7370 *
7380 *
7390 *
7400 *
7410 *
7420 *
7430 *
7440 *
7450 *
7460 *
7470 *
7480 *
7490 *
7500 *
7510 *
7520 *
7530 *
7540 *
7550 *
7560 *
7570 *
7580 *
7590 *
7591 *
7592 *
7593 *
7594 *
7595 *
7596 *
7597 *
7598 *
7599 *
7600 *
7601 *
7602 *
7603 *
7604 *
7605 *
7606 *
7607 *
7608 *
7609 *
7610 *
7611 *
7612 *
7613 *
7614 *
7615 *
7616 *
7617 *
7618 *
7619 *
7620 *
7621 *
7622 *
7623 *
7624 *
7625 *
7626 *
7627 *
7628 *
7629 *
7630 *
7631 *
7632 *
7633 *
7634 *
7635 *
7636 *
7637 *
7638 *
7639 *
7640 *
7641 *
7642 *
7643 *
7644 *
7645 *
7646 *
7647 *
7648 *
7649 *
7650 *
7651 *
7652 *
7653 *
7654 *
7655 *
7656 *
7657 *
7658 *
7659 *
7660 *
7661 *
7662 *
7663 *
7664 *
7665 *
7666 *
7667 *
7668 *
7669 *
7670 *
7671 *
7672 *
7673 *
7674 *
7675 *
7676 *
7677 *
7678 *
7679 *
7680 *
7681 *
7682 *
7683 *
7684 *
7685 *
7686 *
7687 *
7688 *
7689 *
7690 *
7691 *
7692 *
7693 *
7694 *
7695 *
7696 *
7697 *
7698 *
7699 *
7700 *
7701 *
7702 *
7703 *
7704 *
7705 *
7706 *
7707 *
7708 *
7709 *
7710 *
7711 *
7712 *
7713 *
7714 *
7715 *
7716 *
7717 *
7718 *
7719 *
7720 *
7721 *
7722 *
7723 *
7724 *
7725 *
7726 *
7727 *
7728 *
7729 *
7730 *
7731 *
7732 *
7733 *
7734 *
7735 *
7736 *
7737 *
7738 *
7739 *
7740 *
7741 *
7742 *
7743 *
7744 *
7745 *
7746 *
7747 *
7748 *
7749 *
7750 *
7751 *
7752 *
7753 *
7754 *
7755 *
7756 *
7757 *
7758 *
7759 *
7760 *
7761 *
7762 *
7763 *
7764 *
7765 *
7766 *
7767 *
7768 *
7769 *
7770 *
7771 *
7772 *
7773 *
7774 *
7775 *
7776 *
7777 *
7778 *
7779 *
7780 *
7781 *
7782 *
7783 *
7784 *
7785 *
7786 *
7787 *
7788 *
7789 *
7790 *
7791 *
7792 *
7793 *
7794 *
7795 *
7796 *
7797 *
7798 *
7799 *
7800 *
7801 *
7802 *
7803 *
7804 *
7805 *
7806 *
7807 *
7808 *
7809 *
7810 *
7811 *
7812 *
7813 *
7814 *
7815 *
7816 *
7817 *
7818 *
7819 *
7820 *
7821 *
7822 *
7823 *
7824 *
7825 *
7826 *
7827 *
7828 *
7829 *
7830 *
7831 *
7832 *
7833 *
7834 *
7835 *
7836 *
7837 *
7838 *
7839 *
7840 *
7841 *
7842 *
7843 *
7844 *
7845 *
7846 *
7847 *
7848 *
7849 *
7850 *
7851 *
7852 *
7853 *
7854 *
7855 *
7856 *
7857 *
7858 *
7859 *
7860 *
7861 *
7862 *
7863 *
7864 *
7865 *
7866 *
7867 *
7868 *
7869 *
7870 *
7871 *
7872 *
7873 *
7874 *
7875 *
7876 *
7877 *
7878 *
7879 *
7880 *
7881 *
7882 *
7883 *
7884 *
7885 *
7886 *
7887 *
7888 *
7889 *
7890 *
7891 *
7892 *
7893 *
7894 *
7895 *
7896 *
7897 *
7898 *
7899 *
7900 *
7901 *
7902 *
7903 *
7904 *
7905 *
7906 *
7907 *
7908 *
7909 *
7910 *
7911 *
7912 *
7913 *
7914 *
7915 *
7916 *
7917 *
7918 *
7919 *
7920 *
7921 *
7922 *
7923 *
7924 *
7925 *
7926 *
7927 *
7928 *
7929 *
7930 *
7931 *
7932 *
7933 *
7934 *
7935 *
7936 *
7937 *
7938 *
7939 *
7940 *
7941 *
7942 *
7943 *
7944 *
7945 *
7946 *
7947 *
7948 *
7949 *
7950 *
7951 *
7952 *
7953 *
7954 *
7955 *
7956 *
7957 *
7958 *
7959 *
7960 *
7961 *
7962 *
7963 *
7964 *
7965 *
7966 *
7967 *
7968 *
7969 *
7970 *
7971 *
7972 *
7973 *
7974 *
7975 *
7976 *
7977 *
7978 *
7979 *
7980 *
7981 *
7982 *
7983 *
7984 *
7985 *
7986 *
7987 *
7988 *
7989 *
7990 *
7991 *
7992 *
7993 *
7994 *
7995 *
7996 *
7997 *
7998 *
7999 *
8000 *
8001 *
8002 *
8003 *
8004 *
8005 *
8006 *
8007 *
8008 *
8009 *
8010 *
8011 *
8012 *
8013 *
8014 *
8015 *
8016 *
8017 *
8018 *
8019 *
8020 *
8021 *
8022 *
8023 *
8024 *
8025 *
8026 *
8027 *
8028 *
8029 *
8030 *
8031 *
8032 *
8033 *
8034 *
8035 *
8036 *
8037 *
8038 *
8039 *
8040 *
8041 *
8042 *
8043 *
8044 *
8045 *
8046 *
8047 *
8048 *
8049 *
8050 *
8051 *
8052 *
8053 *
8054 *
8055 *
8056 *
8057 *
8058 *
8059 *
8060 *
8061 *
8062 *
8063 *
8064 *
8065 *
8066 *
8067 *
8068 *
8069 *
8070 *
8071 *
8072 *
8073 *
8074 *
8075 *
8076 *
8077 *
8078 *
8079 *
8080 *
8081 *
8082 *
8083 *
8084 *
8085 *
8086 *
8087 *
8088 *
8089 *
8090 *
8091 *
8092 *
8093 *
8094 *
8095 *
8096 *
8097 *
8098 *
8099 *
8100 *
8101 *
8102 *
8103 *
8104 *
8105 *
8106 *
8107 *
8108 *
8109 *
8110 *
8111 *
8112 *
8113 *
8114 *
8115 *
8116 *
8117 *
8118 *
8119 *
8120 *
8121 *
8122 *
8123 *
8124 *
8125 *
8126 *
8127 *
8128 *
8129 *
8130 *
8131 *
8132 *
8133 *
8134 *
8135 *
8136 *
8137 *
8138 *
8139 *
8140 *
8141 *
8142 *
8143 *
8144 *
8145 *
8146 *
8147 *
8148 *
8149 *
8150 *
8151 *
8152 *
8153 *
8154 *
8155 *
8156 *
8157 *
8158 *
8159 *
8160 *
8161 *
8162 *
8163 *
8164 *
8165 *
8166 *
8167 *
8168 *
8169 *
8170 *
8171 *
8172 *
8173 *
8174 *
8175 *
8176 *
8177 *
8178 *
8179 *
8180 *
8181 *
8182 *
8183 *
8184 *
8185 *
8186 *
8187 *
8188 *
8189 *
8190 *
8191 *
8192 *
8193 *
8194 *
8195 *
8196 *
8197 *
8198 *
8199 *
8200 *
8201 *
8202 *
8203 *
8204 *
8205 *
8206 *
8207 *
8208 *
8209 *
8210 *
8211 *
8212 *
8213 *
8214 *
8215 *
8216 *
8217 *
8218 *
8219 *
8220 *
8221 *
8222 *
8223 *
8224 *
8225 *
8226 *
8227 *
8228 *
8229 *
8230 *
8231 *
8232 *
8233 *
8234 *
8235 *
8236 *
8237 *
8238 *
8239 *
8240 *
8241 *
8242 *
8243 *
8244 *
8245 *
8246 *
8247 *
8248 *
8249 *
8250 *
8251 *
8252 *
8253 *
8254 *
8255 *
8256 *
8257 *
8258 *
8259 *
8260 *
8261 *
8262 *
8263 *
8264 *
8265 *
8266 *
8267 *
8268 *
8269 *
8270 *
8271 *
8272 *
8273 *
8274 *
8275 *
8276 *
8277 *
8278 *
8279 *
8280 *
8281 *
8282 *
8283 *
8284 *
8285 *
8286 *
8287 *
8288 *
8289 *
8290 *
8291 *
8292 *
8293 *
8294 *
8295 *
8296 *
8297 *
8298 *
8299 *
8300 *
8301 *
8302 *
8303 *
8304 *
8305 *
8306 *
8307 *
8308 *
8309 *
8310 *
8311 *
8312 *
8313 *
8314 *
8315 *
8316 *
8317 *
8318 *
8319 *
8320 *
8321 *
8322 *
8323 *
8324 *
8325 *
8326 *
8327 *
8328 *
8329 *
8330 *
8331 *
8332 *
8333 *
8334 *
8335 *
8336 *
8337 *
8338 *
8339 *
8340 *
8341 *
8342 *
8343 *
8344 *
8345 *
8346 *
8347 *
8348 *
8349 *
8350 *
8351 *
8352 *
8353 *
8354 *
8355 *
8356 *
8357 *
8358 *
8359 *
8360 *
8361 *
8362 *
8363 *
8364 *
8365 *
8366 *
8367 *
8368 *
8369 *
8370 *
8371 *
8372 *
8373 *
8374 *
8375 *
8376 *
8377 *
8378 *
8379 *
8380 *
8381 *
8382 *
8383 *
8384 *
8385 *
8386 *
8387 *
8388 *
8389 *
8390 *
8391 *
8392 *
8393 *
8394 *
8395 *
8396 *
8397 *
8398 *
8399 *
8400 *
8401 *
8402 *
8403 *
8404 *
8405 *
8406 *
8407 *
8408 *
8409 *
8410 *
8411 *
8412 *
8413 *
8414 *
8415 *
8416 *
8417 *
8418 *
8419 *
8420 *
8421 *
8422 *
8423 *
8424 *
8425 *
8426 *
8427 *
8428 *
8429 *
8430 *
8431 *
8432 *
8433 *
8434 *
8435 *
8436 *
8437 *
8438 *
8439 *
8440 *
8441 *
8442 *
8443 *
8444 *
8445 *
8446 *
8447 *
8448 *
8449 *
8450 *
8451 *
8452 *
8453 *
8454 *
8455 *
8456 *
8457 *
8458 *
8459 *
8460 *
8461 *
8462 *
8463 *
8464 *
8465 *
8466 *
8467 *
8468 *
8469 *
8470 *
8471 *
8472 *
8473 *
8474 *
8475 *
8476 *
8477 *
8478 *
8479 *
8480 *
8481 *
8482 *
8483 *
8484 *
8485 *
8486 *
8487 *
8488 *
8489 *
8490 *
8491 *
8492 *
8493 *
8494 *
8495 *
8496 *
8497 *
8498 *
8499 *
8500 *
8501 *
8502 *
8503 *
8504 *
8505 *
8506 *
8507 *
8508 *
8509 *
8510 *
8511 *
8512 *
8513 *
8514 *
8515 *
8516 *
8517 *
8518 *
8519 *
8520 *
8521 *
8522 *
8523 *
8524 *
8525 *
8526 *
8527 *
8528 *
8529 *
8530 *
8531 *
8532 *
8533 *
8534 *
8535 *
8536 *
8537 *
8538 *
8539 *
8540 *
8541 *
8542 *
8543 *
8544 *
8545 *
8546 *
8547 *
8548 *
8549 *
8550 *
8551 *
8552 *
8553 *
8554 *
8555 *
8556 *
8557 *
8558 *
8559 *
8560 *
8561 *
8562 *
8563 *
8564 *
8565 *
8566 *
8567 *
8568 *
8569 *
8570 *
8571 *
8572 *
8573 *
8574 *
8575 *
8576 *
8577 *
8578 *
8579 *
8580 *
8581 *
8582 *
8583 *
8584 *
8585 *
8586 *
8587 *
8588 *
8589 *
8590 *
8591 *
8592 *
8593 *
8594 *
8595 *
8596 *
8597 *
8598 *
85
```

## **Programming: Atari ST**

terns in which to fill your drawings. When the program is first entered and run, the output screen will be cleared and brought to full size.

A selection of patterns will appear at the top of the screen, and a list of options on the left hand side.

To change either the shading pattern or the cursor type, move the arrow on to your

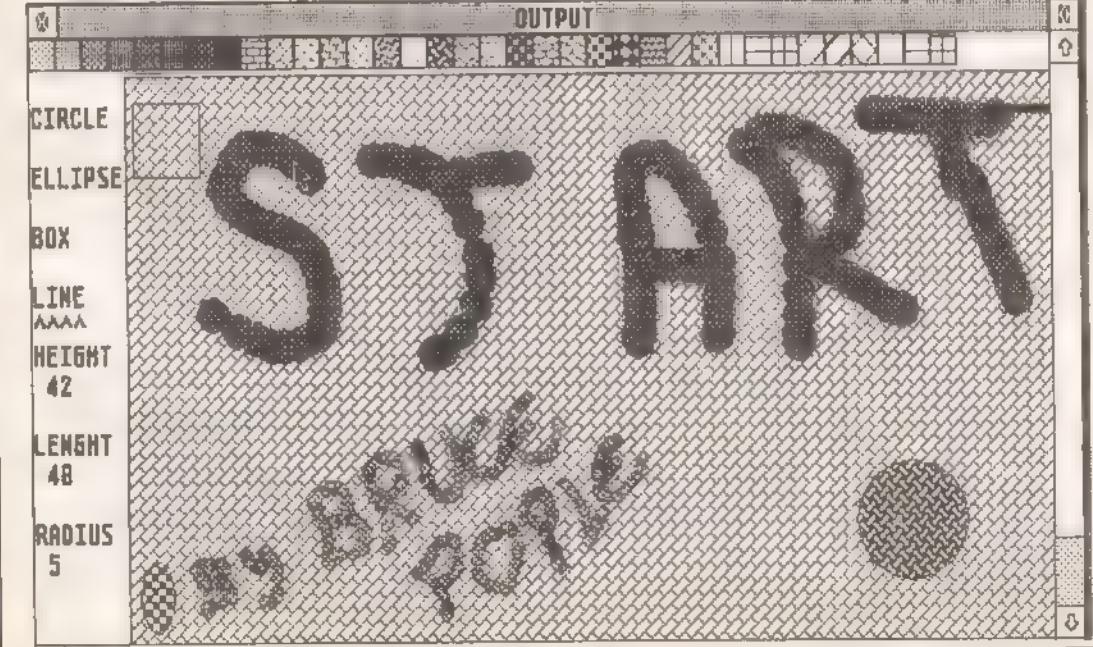
choice and press the left hand cursor key. To change the cursor dimensions (Height, Length and Radius) move over the option and use the left mouse key to increase the variable, and the right hand key to decrease the variable. The radius variable only applies to the circle cursor.

When drawing, the left mouse button prints the selected option, while the right

button deletes it. Both buttons pressed at once cause the area surrounding the cursor to be filled. Watch for pixel caps!

To get a screen dump of your masterpiece, press the alternate key and help. The program has a lot of scope for additional routines and alterations; it also shows that the relatively slow ST Basic can run fast enough to be used seriously.

Desk File Run Edit Debug





## TOOLBOX

by Paul Murray

This week, the final instalment of our marathon series ■ machine code utilities for your Spectrum - together with a comprehensive reminder on what has gone before. To finish off then, we have Dump. First of all, type *Clear 61900* - (in fact, you should do this every time you enter any of the code from the whole Toolkit suite). Now run the Basic loader we printed all those weeks ago, and enter the code listed this week. ■ the checksums come up OK, save the code to tape.

Dump is a variable dump routine which will produce a listing of the variables contained in memory ■ the time at which it is called, together with the values associated with them (except for arrays).

Simple numeric variables are displayed in the form:

Name = value

and simple string variables are shown as.

Name\$ = "Text"

Control variables (ie, those associated with *For-Next* loops), are differentiated from ordinary numeric variables by having a 'greater than' symbol ■ the left of their names, for example

> Name = value

The values of the elements of string and numeric arrays are not displayed, however their dimensions are given inside parentheses, in the fashion used in DIMing them; for example:

A(7,8,9) . . . . .Deriving from Dim A(7,8,9)

or

		Toolbox Command Summary									
		PARAMETERS									
NAME	CALL AT	COMPACT	62000	NONE	SPEED CONTROL : Poke 62335 (0 = SINGLE STEP ELSE 1 TO 255 = FAST TO SLOW)	O/P MEDIUM : POKE 62387 (2 = SCREEN, 3 = PRINTER)					
TRACE	62331				BV = BASE VALUE						
RENUMBER	62704				INC = INCREMENT						
AUTO	63718				ST = START LINE						
HEADER	64010				FIN = FINISH LINE						
ERROR	64163/64167				BV = BASE VALUE						
	(GOsub/Goto)				INC = INCREMENT						
DELETE	64493				NONE						
SEARCH	64613				LIN = LINE TO BRANCH TO ON ERROR						
DUMP	65071				(ERROR CODE PICKED UP AT 64283)						
					FL = FIRST LINE						
					LL = LAST LINE						
					FS = 'FIND' STRING						
					RS = 'REPLACE' STRING						
					O/P MEDIUM : POKE 65076						
					(2 = SCREEN, 3 = PRINTER)						

Q\$(5,10) . . . . .Deriving from Dim Q\$(5,10)

Since the size and number ■ dimensions is given, it is left to the user, if he or she so wishes, to produce a *For-Next* routine ■ print out the actual values of the elements of the array

The routine is called by Randomize Usr 65071 and output may be sent either to screen or printer, using Poke 65071,Output

where Output = 2 results in screen dump, whilst Output = 3 sends the dump to the printer.

Finally, if you have fallen at the last hurdle in the typing stakes (or if you've missed one or two weeks) a tape copy of the whole of the Toolbox suite can be obtained from Paul Murray, for £3.00. Write ■ 5 Hanham Mills, Hanham, Bristol, BS15 3NU.

65071	205	107	13	62	■	65186	0	237	176	229	239
65076	205	1	22	42	75	65191	224	56	205	227	45
65081	92	237	91	89	92	65196	62	13	215	225	201
65086	27	229	167	237	82	65201	229	215	62	40	215
65091	225	200	126	230	224	65206	225	78	35	70	35
65096	7	7	7	61	61	65211	9	229	237	66	86
65101	229	135	95	22	0	65216	35	78	35	70	35
65106	33	102	254	25	94	65221	229	213	205	43	45
65111	35	86	225	1	58	65226	205	227	45	209	21
65116	254	197	213	126	230	65231	122	183	40	8	213
65121	31	198	96	35	201	65236	62	44	215	209	225
65126	114	254	151	254	177	65241	24	230	225	62	41
65131	254	228	254	245	254	65246	215	62	13	215	225
65136	252	254	229	215	62	65251	201	229	215	225	126
65141	36	215	62	61	215	65256	229	203	191	215	225
65146	62	34	215	225	78	65261	203	126	35	40	245
65151	35	70	35	126	229	65266	229	24	164	229	215
65156	197	215	193	225	35	65271	62	36	215	24	183
65161	11	120	177	32	244	65276	229	245	62	62	215
65166	229	62	34	215	62	65281	241	215	62	61	215
65171	13	215	225	201	229	65286	225	205	157	254	17
65176	215	62	61	215	225	65291	13	0	25	201	0
65181	17	146	92	1	5	CHECKSUM=30374					

## Scrolling on CBM64

This is a "block scroll" program, ie, scrolling the background to the left, as your character moves right. A block scroll scrolls the screen 1 whole character in the direction you choose. Here the bottom six lines are scrolled leaving the rest of the screen static (for score and lives, etc). To use the program type the basic loader, which includes a test program.

To use the scroll in your own programs, type out Lines 20-28 of the basic listing into your program and use "SYS 49152" to scroll to the bottom six lines 1 character space. The program scrolls character memory and not colour memory.

## Disc Utility on Amstrad

This short utility program eliminates the need to *cat* your discs before running to decide which of the file names is the one that should be entered.

The bare program (without the *REMS* except Line 1000) should be saved on each of your discs as *Index*. Each time you add a program it is only necessary to add a *Data* line containing the normal name of the program followed by a comma and then the disc loading title.

If you are tidy minded the line numbers can be arranged to keep the titles in alphabetical order but this is not necessary.

To use the program insert a disc then Run "INDEX". All program titles will then be displayed with an associated number. When the number is entered the selected program will then load as normal.

A maximum of 21 titles can be displayed, but an absolute maximum of 23 titles can be shown by scrolling up the heading. This is normally more than adequate, particularly when commercial programs are on

the disc.

## Break Key on Spectrum *by David Tumme*

First, type the program into the computer and then follow the instructions on screen. When it asks for a key to be pressed for the new Break key, press the key you wish to use, but remember that only the old Break key works when loading in a new program.

The new Break key will break out of all Basic programs (even in *Input* statements), and will break out of some machine code routines.

To save the program, type: *Goto 9999.*

Remember that after every New statement you use, the new Break key must be re-installed by typing Randomize Usr 65120.

```

10 MODE 1:DIM x$(23),y$(23)
20 LOCATE 15,1:PRINT"DISC MENU":PRINT
30 X=1
40 WHILE x$(x-1)<>"zzz"
50 READ x$(x),y$(x)
60 PRINT x$("")...|x$(x)
70 X=X+1
80 WEND
90 LOCATE 1,X+1:PRINT CHR$(18):PRINT
100 PRINT"PLEASE ENTER SELECTION 1 to"|
x-2:PRINT"or 99 to CHANGE TO ANOTHER
DISC ":";INPUT",Y
110 IF Y=99 THEN 3000
120 CLS:LOCATE 13,1:PRINT"LOADING "||X$(Y)
130 RUN Y$(Y)
1400 REM ** ENTER DATA 1 lines here in the
form DATA PROGNAME,disc name
1010 'e.g.1010 DATA COMBAT LYNX,combat
1020 'e.g.1020 DATA MASTERCALC,mastload
1030 'e.g.1030 DATA TASWORD,tasword
2000 DATA zzz,zzz
3000 CLS:LOCATE 1,10:PRINT"INSERT NEW DISC
THEN PRESS ANY KEY"
4000 WHILE INKEY$="":WEND:RUN"INDEX"

```

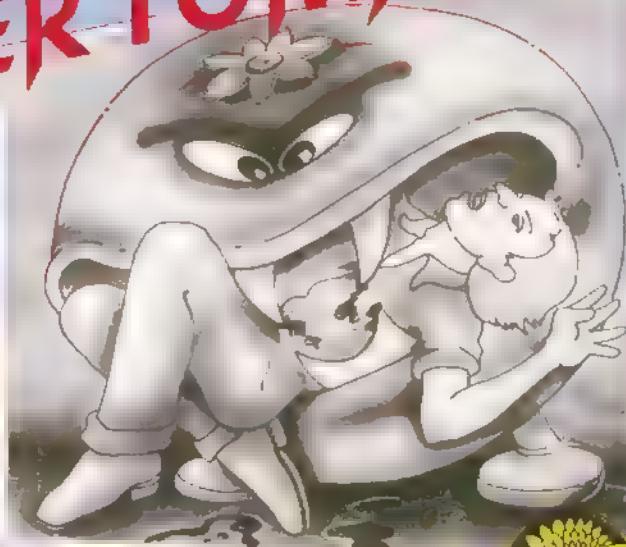
```

4 CLEAR 65119
5 GOSUB 200
10 FOR x:=65120 TO 65126
20 READ a: POKE x,a: NEXT x
30 DATA 62,9,237,71,237,94,201
40 FOR x=65129 TO 65146
50 READ a: POKE x,a: NEXT x
60 DATA 255,243,245
70 DATA 58,8,92,254,n,32,5,241
,251,205,3,19
80 DATA 241,251,201
90 PRINT "Press Break or space
to escape from program"
100 PRINT "Press any key to NE
W"
110 PRINT "Then type RAND USR
65120"
120 PAUSE 0: PAUSE 0
130 NEW
200 PRINT "Press key for Break
key (space = normal) Break: ke
y"
210 LET n=CODE INKEY$*
220 IF n=0 THEN GOTO 210
230 RETURN
9998 STOP
9999 SAVE CHR$ 22+CHR$ 1+CHR$ 0+"Break"+CHR$ 6 LINE 4

```

Nominated for the "Worst Vegetable Movie of all Time"

# KILLER TOMATOES



## Squash 'em or be squashed!

Based on one of those all-time lows in the world of movie making that were actually nominated for a Golden Turkey Award, the Attack of the Killer Tomatoes squelches on to your screens courtesy of Global Software.

It's a bit of a sauce, really. There's Wimp Plasbott, working away in the PuraTom (tm) processing plant, when suddenly, several hundred killer tomatoes turn on you.

Rotten aren't they?

All you have to do is to help Wimp keep the Pizza Parlours well supplied with puree while attempting to hammer the reds before they can do the same to you.

It sounds absolutely killing, doesn't it?

But can you stand the sight of rivers running red? And have you got the bottle for it?

If you haven't had squash-

Available for: Spectrum 48K, all Amstrad CPC machines and all MSX 64K machines

Available through all good dealers

Send cheques & P.O.'s to:



**GLOBAL  
SOFTWARE**

P.O. Box 67, London SW11 1BS.

Tel: 01-228 1322

# Become a sysop with Communitel

David Wallin looks at Communitel, another Bulletin Board software package, for would-be BB operators

**A** few weeks back we dealt with FBBS budget Bulletin Board software for prospective sysops. This week I'll be giving you information about the Communitel system, which is Bulletin Board software and a whole lot more as well.

The Communitel package was designed for a specific purpose when it was first written: to enable the 200 or so ITCs (Information Technology Exchange Centres) in the country to communicate with each other.

Now it is available for any BBC B owner to set up their own Bulletin Board

There are three versions of the software available. The one I will be describing is 'level two' which is the most comprehensive (and expensive) of the packages. Levels one and one-plus of the software are for off-line use (no modem-to-modem link). Prepare yourself for a shock: the price is £375!

Before you decide that it's far too expensive bear in mind that the price includes an excellent modem, manufactured by Dacum and 'Intelligent' that is, it has built in firmware and a CPU. It has autodial, auto answer, 1200/75, 75/1200 and 300/300 baud rates, and connect/disconnect protocols.

The modem is totally software controlled so has no knobs or buttons to be fiddled with. This is the main part of your £375. I would assess the modem as being worth £220-£280, that's the price of most intelligent modems with similar features (eg. the Tandata Tm512 at £255). So the software is not so expensive as it would first appear.

Another consideration is that similar systems, such as Metrotel, running on a Torch, cost four figure sums (Metrotel retails at about £1700).

## The software

So what does the other £120 odd buy? The Communitel software is a really easy to use, high quality software package. It has a very comprehensive manual, plenty of illustrations and it's written in plain English rather than jargon.

The software can be configured to your specific terminal settings, printer codes and disc size, etc. so that you can get the most from it and your hardware. On a 100K disc you can store 95 frames and a 200K disc can store 195 frames. Prestel has

some 300,000 frames, so your system won't really compete with it, but 195 frames will keep your spare time to a minimal amount. BBC owners will know that you can store 16 files on a disc side, but don't worry, the software sorts all this out and stores everything in one massive file.

The software is not only for setting up a Bulletin Board, but for accessing it as well. (Screens from other Communitel boards may be received at 1200 baud).

## The features

Using the software is simple: an auto-boot runs the program and you are presented with a menu, which gives these features:

- Search local viewdata base
- Hey Presto! viewdata editor
- Carousel automatic display
- Print Viewdata frames
- Local telesoftware formatter
- On-line host system
- Viewdata/telesoftware terminal (for logging on to other boards)
- Create a new viewdata base file (to set up a new board)
- Change system settings (for re-defining your terminal)
- Exit the viewdata system (to exit the software)

- **Search local viewdata base** – having set up a Bulletin Board it will need rigorous testing. This feature lets you play around with the board just as if you had logged on, but you don't move from your computer. Your keyboard acts as the remote terminal. The usual '#', '{number}', etc. are all fully implemented.

- **Hey Presto! Viewdata Editor** – this is the screen editor for creating your frames. It is said to be by far the best ever on the standard BBC.

It has all the features of the editing computers used by Prestel and is said to be better in some ways. It can handle all types of viewdata graphics, colours, double height, etc. Text and graphics are available simultaneously.

- **Print Viewdata Frames** – this feature is for printing of the screens you have created or screens you have loaded down from another board. Screens may be dumped to any of a long list of printers using most of the popular dumping ROMs.

Either one screen may be dumped or a list may be set up and each will be dumped

in turn.

- **Local Telesoftware Formatter** – this is a powerful utility for converting a BBC program, data or text file into CET standard telesoftware

To be downloadable, on a viewdata board, telesoftware must be in CET standard form (CET – the Council for Educational Technology).

- **Carousel Automatic Display** – this section lets you set up an electronic slide show of frames. That means that you can define a series of frames, in a list, and each one will be displayed in turn, after a specific time delay has been reached. This is an off-line section only which means that there is no modem link involved. This is like the systems used at many travel agents, tourist information centres, exhibitions, shows and displays.

- **On-Line Host** – this is the magic part that puts you on-line. The board which you have set up and tested on the *search local viewdata base* feature will be running and await a caller. It will answer the phone and send you frames in the order you specified.

## The structure

The frames are set up in a tree structure, with frames branching out from each other. You must set up a main menu, hello frame and log off frame. Messages may be left on the system and are usually left at page 910.

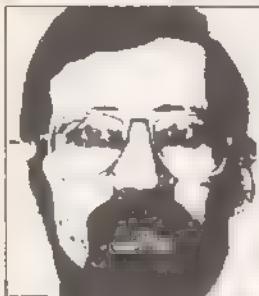
Included are three example databases for messing about with to get used to the software.

So if you want to start a Viewdata board and you've got about £400 just lying about, then this is ideal. In the future I hope to look at the Linemaster ROM for the BBC which is only £10, but it also lets you start a Viewdata board.

More information, or indeed, the software itself is available from Communitel Ltd, 189 Preston Road, London W10 6TH (01-960 7998).

If you have any queries, tips or comments to make about any aspect of micro communications, David Wallin would love to hear from you.

Write to him at *Popular Computing* Weekly 12-13 Little Newport Street, London WC2H 7PP.



## Machine incompatibility

Phillip Lock, of Leamington Spa, Warwickshire, writes:

**Q** A friend of mine gave me a tape with live games for the Amstrad. I was wondering if it is possible to run the games through my Spectrum 48K and if there is any listing available to allow me to load the tape.

**A** Mmm, tricky, but the simple answer is, you can't. The problem is, for a start, the two tape loading systems are incompatible, as are the machines. The architecture (the way the memory is set out) is radically different on the two machines so that programs for the Amstrad would not run on the Spectrum, and vice versa. However, it is just possible that you could rearrange the Spectrum's tape loading system so that it would read the tape. But, even if you did, it would be a complete waste of time.

## Sprite wrap

Mrs Lin Wyle, of Hounslow, Middlesex, writes:

**Q** I have just got my hands on a Commodore computer and find that I am very interested in sprites and user defined graphics. I have managed to make up a few routines for both, using *Flip*, *Turn*, *Invert*, and *Roll* (with wrap around) moving up and down.

What I cannot do is make them wrap around from right to left or vice versa.

**A** I presume you mean that you are writing a designer program for the sprites and UDGs and that while designing them you want to *Roll* from

right to left with wrap.

This is fairly easily done if you take into account that the definitions (for UDGs that start with) are held in the computer as 8 bit bytes. Consider one line for instance is 50, in binary this is 00110010, and to shift it left or right, simply multiply, or divide by two respectively. So left would be 100 (decimal) or 01100100 (binary) and right 25 (00011001). To wrap around to the right, check whether the result of the division is a whole number or not. If not, then add 128 to the result, ie, place the bit shifted out of the right hand side into the left hand side.

For left shift, check whether the result of the multiplication is greater than 255. If so, add one and And with 255. So, the following program that will scroll all 8 lines of a UDG left or right

```

10 FOR T=0 TO 7
20 READ A
30 POKE 12288+T,A
40 NEXT
50 POKE 53272,28
60 PRINT "REARRANGING SPRITES"
70 GET AS
80 IF AS < " " THEN GOSUB 200
90 IF AS = "-" THEN GOSUB 400
100 IF AS = ">" THEN 70
110 POKE 53272,21
120 END
200 FOR T=0 TO 7
210 A=PEEK(12288+T)
220 A=A/2
230 IF A < > INT(A) THEN A=A+128
240 POKE 12288+T,INT(A)
250 NEXT
260 RETURN
400 FOR T=0 TO 7
410 A=PEEK(12288+T)
420 A=A*2
430 IF A > 255 THEN A=A+1:A=A
        AND 255
440 POKE 12288+T,A
450 NEXT
460 RETURN

```

## Polyphonic problem

Paul Holdaway, of Stockport, writes:

**Q** I have had some difficulty when trying to write simple music on the Amstrad. When I type in two music lines which are the same note, but not necessarily the same value, and then *Run* the program, the computer plays the notes as if they were only one. So, instead of a slight break in between the two notes, they are played as a continuous tone. How can you help me get

around this, in the most simple way?

**A** Try this:

```

10 FOR T=0 TO 100
20 SOUND 1,200,40,7
30 SOUND 2,300,10,7
40 NEXT

```

What this does is fill up places in the sound queue until there are none left and hence play both notes simultaneously. What you want to do is to make them play separately. This can be done by including the following lines:

```

25 IF (SO(1) AND 128) = THEN 25
35 IF (SO(2) AND 128) = THEN 35

```

What these do is check whether the note is currently in use and wait until it is finished. When it has, then the next note can be played. The alternatives to this method are either to use envelopes (a little bit more sophisticated), or use only one channel

## A phased interface

Jonathan Farmer, of Edinburgh, writes:

**Q** I'm having problems with my Interface 1 and 48K Spectrum. Although it is properly connected, the computer does not accept valid commands and prints the usual "?"'. I've tried cleaning the Spectrum edge connector with a pencil erasure and an alcohol based cleaning fluid as the man from Sinclair Research suggested, but neither have worked.

I have had the problem before but usually it has fixed itself. This time it hasn't. However, if a *Clear* command is entered with a value between approximately 53000 and 64000, then it is possible to *Call* a cartridge and also enter *Run* after *New* to load the 'run' program I have on most cartridges. But, if *Load*, *Save* or *Merge* are entered for the

microdrive, then the computer loads, saves or merges from tape instead.

Also, although the Alphacom 32 printer and Protek joystick work when plugged into the interface, using the joystick in cursor mode allows all movements except left, but works perfectly in Kempston and Interface 2 modes.

Do I have a bad connection between the interface and my Spectrum, or is my interface faulty?

**A** It looks as though the connection between the interface and the Spectrum is at fault here, although it is difficult to be certain.

There are a number of alternatives. The Spectrum or interface may be broken, although if it is the Spectrum, it should be obvious, since it is rare that they only go slightly wrong.

If it is the interface then the same may not apply but, being able to get a catalogue and load the 'run' program makes it sound all right.

So we come down to the connection between the two. You say that you tried cleaning the edge connector on the Spectrum; it may be worthwhile trying to clean the connector on the Interface 1. Fixing this, you may have a broken connection on either device, possibly the Rom select line.

If so, fixing could be difficult depending on how good you are with a soldering iron. The best thing to do in this case is to try getting the system fixed at one of the repair companies that advertise for this kind of work in the back of this magazine. This can be expensive, so it is better to get a quote before they fix it.

If this is nearly the price of a new system, you may as well get a new one (I presume that the guarantee has run out) 48K Spectrums do not cost the earth at the moment.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD





# The 1st choice EXPRESS SPECTRUM, BBC and COMMODORE REPAIRS!

SOFTWARE  
BBC £24.00 FREE WITH  
EVERY REPAIR\*

## WHY PAY HIGH 'FIXED' PRICES

\*Spectrum only

We do not charge you for our fancy premises by charging high 'fixed' prices!

Reputations take time to build, we have been repairing ZX 81's, Spectrums, QLs, Apples and BBC's professionally for 2½ years - who is coming second?

Initial UK and Worldwide repairs!

With INTERNATIONAL repair service to charge LOW PRICES for the smaller repairs! (Up to £20 for keyboard faults)

**FOR FOLLOW PHILIPS** - My computer was broken, I took it to MANCOMP, they fixed it. In 3 weeks, and for less than £50! They are local, just £5 less per repair, highly efficient! 41 LOCATIONS NATION

**FUN PROFESSIONAL** - 'Of all the repair companies in the UK, you speak to the most MANCOMP earned the most PROFESSIONAL awards come to advice and a helpful attitude' - JAC 85

NOTE OUR PRICES AND WATCH OTHERS FOLLOW THE LEADER

Spectrum  
repairs between  
£5 and £20

BBC repairs  
between  
£14 and £25

Commodore  
repairs between  
£14 and £25

YOU DO NOT LIKE OUR ESTIMATE  
WE WILL RETURN THE COMPUTER  
AND PAY FOR THE POSTAGE INCURRED

**MANCOMP LTD**  
(Dept. PCW18)

Printworks Lane, Leyeslune,

Manchester M10 3EP

Phone 061-224 1888

OR 061-224 9888

OPEN MON-SAT 9am to 7pm



What we do today  
others do tomorrow!

## SPECTRUM — AMSTRAD — COMMODORE NOBLES COMPUTER REPAIRS

— MSX — ATARI —

• Repairs carried out by our own engineers on site.

• All repairs carry a 4 MONTH GUARANTEE

For estimates phone or send your computer to NOBLES.  
Spectrum Plus ..... £16.95 inc parts  
post and pack

Commodore 64/VIC 20 ..... from £16.95 plus  
parts

BBC ..... from £16.95 plus  
parts

Also repair specialists for Amstrad and MSX computers

### NO HIDDEN CHARGES

## ★SPECIAL OFFER

5 FREE GAMES WORTH £25

with each Spectrum repair Trade/School and Club discounts arranged.

\*For free, no obligation estimates phone or send your computer to NOBLES for the fastest, cheapest repairs in  
ESSEX

### NOBLES

14-17 Eastern Esplanade  
Southend-on-Sea  
Essex  
0702 633778  
63336/7/8/9

7 days a week, 24-hour Answering Service

SPECTRUM — AMSTRAD — COMMODORE

## COMPUTER REPAIRS

ALL MACHINES DESPATCHED  
WITHIN 72 HOURS OF RECEIPT

For example	
Spectrum Plus	£17.00
16.48 RAM Upgrade.	£25.00
ZX81	£12.50
Interfacing	£18.00
ZX Microdrive	£10.50
BBC B	£25.00

(All prices include parts, VAT, labour, return postage insured, and full warranty)

For a fast and reliable service send machine, brief description of fault and cheque or PO for relevant amount to the experts

## CAPITAL COMPUTER SERVICES

Doug P

Unit K2, Cardiff Workshops

Lewis Road, East Moors

Cardiff CF1 5ED

Tel: Cardiff (0222) 461801

Or visit our on-line BBS, Compucom (2000) and BBS systems. Use the telephone code 1-1-0-0

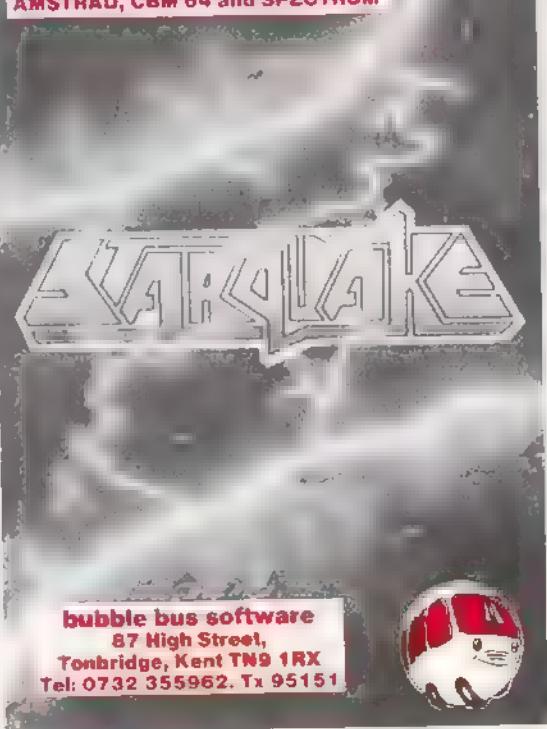
## BBC SPECTRUM REPAIRS

- Spectrum repair £16.95 inc parts in  
Essex and Suffolk
- BBC B repair £18.50 + parts, insurance  
and delivery

Send your computer with cheque or PO  
for £16.95 and description of fault to

**SUREDATA (PCW)**  
Computer Service  
49 Wychwood Avenue, Edgeware,  
Middlesex  
Tel: 01-851 0124

This award winner now available for:  
**AMSTRAD, CBM 64 and SPECTRUM**







# There's a Dealer near you . . .

## BIRMINGHAM

D.G. MICROTEK ELECTRONICS  
1908 DUDLEY ROAD  
WINSON GREEN  
BIRMINGHAM  
Tel: (021) 454 4697

## ESSEX

NOBLES  
14-17 EASTERN  
ESPLANADE  
SOUTHEND-ON-SEA,  
ESSEX  
Tel: (0702) 63377/8

CAREY ELECTRONICS  
FOR  
THE  MICROCOMPUTER  
SYSTEM  
COMPUTERS, AND SOFTWARE,  
PERIPHERALS.  
7 CHURCH ROAD  
WALTON-ON-NAZE, ESSEX  
FRINTON-ON-SEA (0256) 6993  
9am-9pm

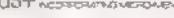
H REYNOLDS  
79 ORSETT ROAD  
GRAYS, ESSEX  
Tel: (0375) 375348

MIKES COMPUTER STORE  
292 LONDON ROAD  
WESTCLIFF-ON-SEA  
ESSEX  
Tel: (0702) 332554



520 STM  
£399

## Communication

PLUS+   
5 HONEYWOOD ROAD  
(011 Cranes Farm Rd)  
BASILDON  
Tel: (0268) 21818

## HUMBERSIDE

THE COMPUTER CENTRE  
  
26 AMBLAY ROAD  
HULL  
NORTH HUMBERSIDE  
0482 26297

## LONDON

LOGIC SALES  
19 THE BROADWAY  
THE BOURNE, SOUTHGATE  
LONDON N14  
Tel: 01-882 4942

PL 100

## Communication

PLUS+   
C/O KEDDIES  
(second floor)  
HIGH STREET  
SOUTHEND  
Tel: (0702) 62426

## KENT

ANHROG COMPUTERS  
29 West Hill  
Bartford  
Kent  
Tel: (0322) 91649

PL 100

**dgh** software centre

10 NORTH STREET,  
ASHFORD, KENT  
Tel: (0233) 32697

PL 100

SOFTWARE STORE LTD  
35 LONDON ROAD  
LONDON SW17  
Tel: 01-685 1476

PL 100

## ESTUARY

PERSONAL COMPUTERS  
318 CHARTWELL NORTH  
VICTORIA CIRCUS SHOPPING CENTRE  
SOUTHEND ON SEA  
Tel: (0702) 614131

## MICROWAY COMPUTERS

39 HIGH STREET  
RAINHAM, KENT  
Tel: (0634) 376702

PL 100

## GLASGOW

THE COMPUTER DEPOT  
BUCHANAN STREET  
GLASGOW G1 2JZ  
Tel: (041) 332 3944

PL 100

## MIDDLESEX

INNOVATIONS  
COMPUTER & VIDEO  
9 HARMONDSWORTH ROAD  
WEST DRAYTON  
MIDDLESEX UB7 5JW  
Tel: (0895) 420457

PL 100

## LIVERPOOL

**BLUE CHIP**  
BLUE CHIP  
77 ALLERTON ROAD  
LIVERPOOL L18 2DA  
Tel: (051) 722 3037

PL 100

## HEREFORDSHIRE

HONEYSETT COMPUTERS  
17 UNION STREET  
HEREFORD HR1 2BT  
Tel: (0432) 279404  
ASK ABOUT  
CLUNKER SALE

PL 100

## LEICESTERSHIRE

DIMENSION COMPUTERS LTD  
27-29 HIGH STREET  
LEICESTER  
Tel: (0533) 57479

PL 100

## SUSSEX

GATWICK COMPUTERS  
62 THE BOULEVARD  
CRAWLEY, SUSSEX  
Tel: (0293) 26240/37842

PL 100

**SUFFOLK**

FOR MSX, SPECTRUM,  
COMMODORE, AMSTRAD



Sudbury Micro Systems  
Computer Repairs & Formulations

84 NORTH STREET  
SUDSBURY  
TEL: SUDSBURY 311839

**STAFFORDSHIRE**

MICROTRONICS  
278 MARKET STREET  
TAMWORTH, STAFFS  
Tel: (0827) 51488

HOME SOFT COMPUTING  
1st FLOOR  
11A BOLEBRIDGE ST  
TAMWORTH  
STAFFS  
(0827) 63549

**S. WALES**

MAPPLE MICRO ASSOCIATES  
FREEPOST  
PO BOX 17  
CWMBRAN  
GWENT NP44 3YT

**YORKSHIRE**

MICRO BYTE SOFTWARE SHOP  
■ COUNTY ARCADE  
LEEDS  
FULL RANGE ■ TOP  
QUALITY SOFTWARE,  
PHONE FOR PRICES  
Tel: (0532) 450 529

YORK COMPUTER CENTRE  
7 STONEGATE ARCADE  
YORK  
Tel: (0904) 641662

**WARWICKSHIRE**

FAST FORWARD COMPUTER STORE  
29 SMITH STREET  
WARWICK  
Tel: (0926) 492004

**NORFOLK**

THEFTFORD MICROS  
SPECIALISTS -  
COMPUTER REPAIRS  
■ GUILDFORD STREET  
THEFTFORD  
NORFOLK  
(0842) 61645

TELEX YOUR  
CLASSIFIED  
COPY TO:  
296275  
SUNRGY

**IMPORTANT  
ANNOUNCEMENT**

TERIVIROS ANTI-STATIC FLUID

TERIVIROS ANTI-STATIC FLUID

TERIVIROS ANTI-STATIC FLUID  
ID £3.50 plus 50p P&P cheque or bank transfer  
Telecommunications Services Ltd

Acc No 5555529

The Marketing Division, Telecommunication  
Services Ltd, 48 Queen Street, Exeter EX4  
3SR

0392 555529

TERIVIROS TRADE & INDUSTRY

MICRO BYTE SOFTWARE SHOP  
19A LOWER WARREN CENTRE

WAKEFIELD

Tel: (0924) 376656

FULL RANGE OF

TOP QUALITY SOFTWARE  
PHONE FOR PRICES

**AMSTRAD UPGRADE**

PCW8256 TO 512K/388K RAM DISC

Plug in 8 RAM CHIPS and change a link Sound  
easy? Our simple comprehensive instructions make it  
so. FIVE A4 pages of information for even the most  
inexperienced.

We supply JIG FREEFORMED CHIPS/NO BENDING  
REQUIRED BEST SELLING UPGRADE KIT IS ONLY  
£32.50.

5½" DISKS. DS/DD-96TPI box of Ten only  
£9.95 inclusive.

**EPROMS**

HITACHI QUALITY - 250nS Access Time - THE  
RELIABLE ONES Prices INCLUDE VAT and UK  
POSTAGE - normally by return.

2764	1-2 PCS	£2.35
	3-9 PCS	£2.25
	10 PLUS	£2.15
27128	1-2 PCS	£3.35
	3-9 PCS	£2.95
	10 PLUS	£2.85
27C 256	1-2 PCS	£7.50
	3-9 PCS	£7.25
	10 PLUS	£7.00

**RAMS**

HITACHI	6264-LP15	1-9 PC	£3.50
		10 PLUS	£3.00

NEC 41264 41464 RAM (SOLIDISK UPGRADE) £8 each  
NEC 48416 (WATFORD UPGRADE) £2.95 each

Send UK cheques/Money Orders/LA  
or Gov't order to:

**SILICON CITY,**  
Mithian, St. Agnes, Cornwall TR5 0QE  
ACCESS/VISA orders,  
telephone 087255 2112.

# New Releases

Graham Taylor looks through this week's new arrivals

## Amstrad

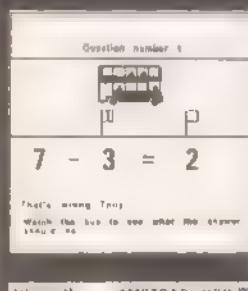
**Program Commando Type** Arcade Machine Amstrad **Price** £9.95 **Supplier** Elite, Anchor House, Anchor Road, Aldridge, Walsall WS9 8PW

**Program Early Words Type** Educational Machine Amstrad **Price** £9.95 **Supplier** Willow Software, The Willows, Wrington Lane, Congresbury BS19 5BQ

**Program Early Maths Type** Educational Machine Amstrad **Price** £7.95 **Supplier** Willow Software, The Willows, Wrington Lane, Congresbury, Bristol BS19 5BQ

**E**ducational software was slow to start on the Amstrad but seems to be growing apace. Willow Software has recently released two packages for the younger age ranges entitled *Early Maths* and *Early Words*.

## Early Maths



*Early Maths* consists of four separate programs covering, in all, age ranges from four to eight. Titles of the programs are, you'll be surprised to hear, *Addition*, *Subtraction*, *Multiplication* and *Division*.

The tasks involved are fairly simple, with basic animated sequences to illustrate the sum being asked. For example, if the child makes a mistake in the addition program, eg. when asked to count the number of figures in two groups, then the figures move individually to enable the correct answer to be discovered.

Similarly a wrong answer in the division program produces a cricketer who bats a series of

balls into a number of boxes representing the divisor.

There are a lot of programs similar to this around, but *Early Maths* is quite neatly produced and is among the better offerings.

**Program Fourmost Adventures Type** Adventure Machine Amstrad **Price** £7.95 **Supplier** Global Software, PO Box 67, London SW11 1BS

**Program Monopoly Type** Amstrad Machine Amstrad **Price** £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX

**Program Price of Magik Type** Adventure Machine Amstrad **Price** £9.95 **Supplier** Level 9 Computing, PO Box 39, Weston-Super-Mare, Avon BS24 9UR

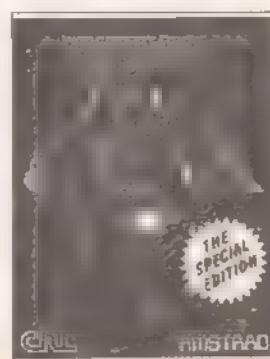
**Program Shadowline Type** Arcade Machine Amstrad **Price** £9.95 **Supplier** Beyond, Wellington House, Upper St Martin Lane, London

**Program Tru Cell Type** Arcade Machine Amstrad discs **Price** £14.95 **Supplier** CRL, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD

**T**his special disc version of CRL's most highly rated game is one of the few special versions - a game that actually delivers some really new material.

Contrasted with the cassette version of the game, the disc edition is much larger, has improved graphics and more complete and complex instructions.

The game is basically the



Pick of the week

## ALTER EGO

**Program Alter Ego Type** Simulation Machine Commodore 64 **Price** £24.99 **Supplier** Activision, 23 Pond Street, London NW3



**A**lter Ego is strange. Partly a game perhaps, partly a simulation perhaps, possibly a lesson in life (well, American life anyway). Whatever it is, the entire office was hooked. You could treat it as an upmarket me-generation parlour game.

The idea is simple - you live a complete life. During that life there are some experiences you may deliberately seek, eg. deciding to get a job. With other experiences, the diverse flotsam and jetsam of existence just crops up from time to time. How you handle each experience determines both how your personality develops and the more mundane details of living, such as what job you get, what material success you have and so on.

Presentation is in the form of a family tree of icons, each icon indicates a certain kind of subject matter, physical wellbeing, family, emotional, risks. As you ascend the tree, time passes and the kinds of experiences you have changes. It works like this: you select an icon and are presented with a situation, you then select your response to the situation from a variety of options presented, and sometimes your selection may be rejected as being completely out of character.

What makes the program so compulsive is the way you may choose to do many things that either would not ordinarily happen to you or which you would ordinarily shy away from. These in-

clude (parents, be warned) a fairly full range of sexual experiences, from Helga the sexual contortionist to starring in porn movies.

However, wild immorality has a cost, not least diseases. Indeed, throughout the program the goody-goody options (no wild sex, no drugs, helping friends in need, getting a good job) are usually the right ones, though occasional debauchery seems to do no harm.

The construction of the game is superb, the way actions interrelate and the range of experiences available are astounding (well, it is based around three discs of data) as is the way your age governs your responses.

It isn't like anything else and is a wonderful game to play as a group (cries of "ignore the suicidal friend" fill the air). Sex proved to be the experience most often sought. Surprise, surprise.

I have only two real objections to the game, firstly it is a bit, well, American, sometimes the 'right' way of handling situations as sickly sentimental "Gee Dad, you're the tops", as American sitcoms. The other problem is that it is very expensive. Nevertheless, there's nothing like it and you will, I predict, be hooked.

same defuse a reactor by finding and assembling a series of cooling rods found inside some of the buildings scattered about the desert planet of Tau Ceti.

The game is a mixture of smoothly scrolling graphics as you skim over the bleak surface of the planet and interiors

when you enter and search around the inside of the various buildings.

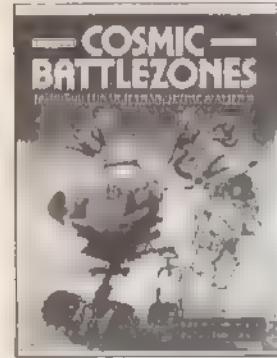
If you haven't seen the original game and have a disc drive, *Tau Ceti* is a must. Even if you have the original, it might be worth investing in this beefed-up disc version.

## BBC

**Program** *Cosmic Battlezones*  
**Type** Arcade Machine BBC  
**Price** £9.95 **Supplier** US Gold,  
 Unit 10, The Parkway Industrial  
 Centre, Hengrove Street, Bir-  
 mingham B7 4LY

**W**ho'd have thought it? Games by Ultimate being bundled together on a compilation, and on the BBC as well. Still it's happening to everyone and even the best games stop selling at some point. There are only three games in the pack, but a good mix: *Alien 8*, *Jetpack* and *Lunar Jetman*. In many ways all of these games are better than Ultimate's current crop.

*Lunar Jetman* came first and whilst it's 'blast everything and collect various objects' scenario is a little dated now (okay, it's very dated indeed) the large sprites still look good and



the basic quality of design is still apparent.

*Lunar Jetman* is, to my mind, the most complicated game Ultimate ever released. On a craggy moonlike surface you move Jetman and Lunar Rover around, seeking out alien missile bases and blasting them to bits. The problem is there are just so many different options. Your rover can either carry a bomb or a gun, then there are transporters shaped like telephone boxes. If that, and dozens of assorted, myriad coloured, aliens isn't enough, there is the problem of the ruts and gulleys in the lunar landscape - every five seconds you get stuck there. Graphically excellent, virtually unplayable.

Finally, *Alien 8*, the follow-up to *Knight Lore*, which retained all the key features of that game but added a few others - some cried 'copy' but I never cared, the original was so fabu-

lous. The game is played in 3D with dozens of strange rooms - the chambers of a spaceship. The task of your Disneyesque robot is to reanimate the crew of the ship, by placing a key in a lock in each of the cryogenic chambers. There are problems in most of the rooms both in getting through them and in getting the required object. Devious, ingenious, graphically and technically stunning.

A pretty good deal for the money then, and worth buying if you've missed any two of the three games in the pack. Sad also, since Ultimate hasn't released anything of the calibre of these games in ages.

## C16

**Program** *Berks Trilogy* **Type** Arcade Machine C16 **Price** £6.95 **Supplier** CRL as above

## Commodore 64

**Program** *Countdown* **Type** Strategy Machine Commodore 64 **Price** £8.95 **Supplier** Macross Software, GBA Cyl 17 Maes Nott, Caerfyrddin, Dyfed SA31 1PO

**Program** *Price of Magik* **Type** Adventure Machine Commodore 64 **Price** £9.95 **Supplier** Electric Dreams Software, 31 Carlton Crescent, Southampton, Hampshire SO1 2EW

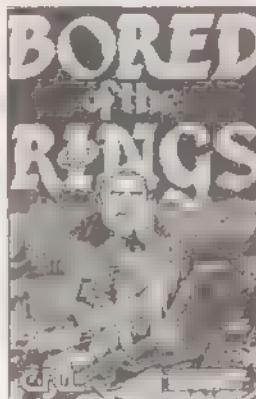
**Program** *Spindizzy* **Type** Arcade Machine Commodore 64 **Price** £9.95 **Supplier** Electric Dreams Software, 31 Carlton Crescent, Southampton, Hampshire SO1 2EW

**Program** *Vidcom 1* **Type** Utility Machine Commodore 64 **Price** £4.95 **Supplier** Alpha Omega, 9 Kings Yard, Carpenter's Road, London E15 2HD

**Program** *Bored of the Rings* **Type** Adventure Machine Commodore 64 **Price** £8.95 **Supplier** CRL Limited, CRL House, 9 King Yard, Carpenter's Road, Stratford, London E15

I don't have the figures but *Bored of the Rings* on the Spectrum must have been at least as successful as *Lord of the Rings*, the official version. Certainly the former got better reviews.

The point about *Bored of the Rings* is that it is genuinely funny, only very occasionally lapsing into schoolboy juvenilia. Not only is it funny but it has a good many tricky puzzles which test the mettle.



Author Fergus McNeil has surely read *Bored of the Rings*, the book, by National Lampoon, since many of the basic ideas are similar, i.e., that Gandalf is actually a dodgy old conjuror more likely to work the three card trick down Oxford Street than cross magical spells for the sake of good. The idea too that Frodo (here Fordo) is actually the only person dumb enough to get stuck with a dead end quest, only Rambo would relish is also not entirely original.

But never mind, the game is great and now that it's been converted to the Commodore 64, a whole new tribe of less than totally serious adventurers can explore its murky depths.

*Bored of the Rings* is enormous (loaded in three sections) and comes with a wonderful bonus in the form of *Sceptical*, the nature of which I will leave you to discover.

## MSX

**Program** *Price of Magik* **Type** Adventure Machine MSX **Price** £9.95 **Supplier** Level 9 Computing as above

## PCW

**Program** *Pascal 80* **Type** Utility Machine PCW 8256 **Price** £39.95 **Supplier** Hisoft, 180 High Street North, Dunstable, Beds LU6 1AT

## QL

**Program** *Ink-Well* **Type** Utility Machine QL **Price** £9.95 **Supplier** Palantir Products, 60 St Lukes Rd, Bedminster, Bristol **N**ot the first, but certainly one of the cheapest, font designer programs for

the QL is *Ink-Well*, a font utility compatible with most QL text editors like the *Quill* and all Epson compatible printers. There are eight fonts supplied on microdrive and the opportunity to construct your own, using a font editing program.

Fonts need not be a full 16 pixels high, thus you may have text of various sizes, and you can also print text with proportional spacing. Instructions are issued to the program via control codes inserted in your document - all *Ink-Well* instructions use the curly brackets, which may not otherwise be used, hardly a great loss. Inside the brackets are simple instructions on which font to select, what sort of line spacing and text spacing. You may also indicate sections to be printed inverse or emphasised.

Altogether a very powerful program. My only quibble is that the supplied fonts don't seem very exciting. Some are too similar to one another and others seem downright ugly. *Ink-Well* is, in other respects, highly recommended.

## Spectrum

**Program** *Price of Magik* **Type** Adventure Machine Spectrum **Price** £9.95 **Supplier** Level 9 Computing as above

**Program** *Rock n Wrestle* **Type** Arcade Machine Spectrum **Price** £9.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston Upon Thames, Surrey KT11 4DB

**Program** *Spindizzy* **Type** Arcade Machine Spectrum **Price** £9.95 **Supplier** Electric Dreams as above

## ST

**Program** *Time Bandit* **Type** Arcade Machine ST **Price** £29.95 **Supplier** Microdeal, PO Box 68, Austell, Cornwall PL25 4YB



## Top Twenty

- 1 (-) Batman (Spectrum, Amstrad)
- 2 (-) Thrust (C64)
- 3 (-) Spindizzy (Spectrum, C64, Amstrad)
- 4 (1) Commando (Various)
- 5 (11) Formula One Simulator (Various)
- 6 (3) Bomb Jack (Spectrum, C64)
- 7 (2) They Sold (2) (Spectrum, C64, Amstrad)
- 8 (14) Spellbound (Spectrum, C64, Amstrad)
- 9 (-) Kik Start (Spectrum, C64, C16)
- 10 (9) Green Beret (Spectrum, C64)



- 11 (4) V (Spectrum, C64)
- 12 (-) International Karate (Spectrum, C64)
- 13 (10) Last V8 (C64, Amstrad, Atari)
- 14 (8) Superbowl (Spectrum, C64, MSX)
- 15 (7) Way Of The Tiger (Spectrum, Amstrad, MSX)
- 16 (12) Heavy On The Magik (Spectrum)
- 17 (6) Comp. Hits 10 Vol 2 (Various)
- 18 (5) PSI-5 Trading Company (Spectrum)
- 19 (13) Starstrike 2 (Spectrum)
- 20 (18) One Man And His Droid (Various)

Ocean  
Firebird  
Electric Dreams  
Elite  
Mastertronic  
Elite  
Hit Squad  
Mastertronic  
Mastertronic  
Imagine



## Top Tens

### Amstrad

- 1 (-) Batman (Ocean)
- 2 (9) Get Dexter (PSS)
- 3 (1) Commando (Elite)
- 4 (2) Last V8 (Mastertronic)
- 5 (6) Into Oblivion (Mastertronic)
- 6 (3) They Sold (2) (Hit Squad)
- 7 (4) Spindizzy (Electric Dreams)
- 8 (8) Comp. Hits 10 (2) (Beau Jolly)
- 9 (-) Turbo Esprit (Ourside)
- 10 (-) Zoids (Mastertronic)



### Atari

- 1 (1) Last V8 (Mastertronic)
- 2 (-) Vegas Jackpot (Mastertronic)
- 3 (8) Scooter (Americana)
- 4 (2) One Man & his Droid (Microline)
- 5 (3) Action Biker (Mastertronic)
- 6 (6) Ollies Follies (Americana)
- 7 (3) New York City (Americana)
- 8 (8) Shamus (Americana)
- 9 (-) Shoot Em Up (Budget)
- 10 (10) Fighter Pilot (Digital Integration)

### BBC

- 1 (1) Commando (Elite)
- 2 (-) Bruce Lee (US Gold)
- 3 (2) Winter Olympics (Tynemouth)
- 4 (9) Moon Cresta (Incentive)
- 5 (7) Phantasm Combat (Doctor Soft)
- 6 (3) Karate Combat (Superior)
- 7 (5) Citadel (Superior)
- 8 (-) Strike Force Hunter (Mirrorsoft)
- 9 (10) Yie Ar Kung Fu (Imagine)
- 10 (8) Speech (Superior)

All figures compiled by Gallup/Microscope

## Commodore 64

- 1 (-) Thrust (Firebird)
- 2 (-) Spindizzy (Electric Dreams)
- 3 (-) Int Karate (System 3)
- 4 (1) PSI-5 Tding Company (Us Gold)
- 5 (3) Bomb Jack (Elite)
- 6 (6) Spellbound (Mastertronic)
- 7 (2) They Sold (2) (Hit Squad)
- 8 (-) F1 Simulator (Mastertronic)
- 9 (5) V (Ocean)
- 10 (6) Kane (Mastertronic)

## Spectrum

- 1 (-) Batman (Ocean)
- 2 (1) Green Beret (Gargoyle)
- 3 (6) Hwy On The Magik (Gargoyle)
- 4 (2) Starstrike 2 (Realtime)
- 5 (-) Quazatron (Hewson)
- 6 (-) Cyberion (Ultimate)
- 7 (5) Bomb Jack (Elite)
- 8 (7) Way Of The Tiger (Gremie)
- 9 (3) V (Ocean)
- 10 (4) Superbowl (Ocean)

## NEXT WEEK

### SPECIAL SUPPLEMENT

It's supplement time at *Popular Computing Weekly* next week, and this time we have a bumper pull-out on the Sinclair Spectrum.

#### ● Microfair report

All the fun of the 19th ZX Microlair held on May 10.

#### ● Word-processing

*The Last Word*, from Saga Systems, lines up against the mighty *Tasword 3*. Which is the best buy?

#### ● Exclusive reviews

Includes *The Edge's* latest, *Bobby Bearing*.

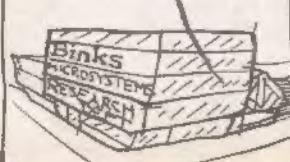
#### ● Spectrum 128 round-up

Confused by all the reports of 'non-compatibility' and 'enhanced versions'? We clear the air with a survey of all the 128-specific titles.

All you need to know about your Spectrum in *Popular* next week - order your copy now.

## The Hackers

Dr. Nibbins, our head of research, is working on several brilliant projects.



You MUST meet him...  
Oh Alastair! - I've... What the blazes do YOU want Binks?!



By the way, I wouldn't mention the ink-jet printer if I were you.



R·M·S

# TITANIC



Explore the world's most famous wreck almost two miles beneath the waves. Search for the massive wealth in treasure that lies inside her and devise a plan to raise the entire ship.

A fast-action icon-driven graphic adventure in which you explore the five levels of the wreck, with more than 240 rooms, and over 170 objects, the majority of which will be found on the actual ship.

Finance your expedition.  
Attend press conferences.  
Map the wreck.  
Raise the Titanic!

*Electric  
Dreams*

SOFTWARE

Available on the Commodore 64, Amstrad and 48k Spectrum from:  
Electric Dreams Software, 31 Carlton Crescent, Southampton. Tel: 0703 229694

# CELEBRATE IN STYLE WITH

Enjoy the excitement of the world's premier sporting occasion as the whole of the globe focuses attention on the ultimate in football achievement — World Cup victory.

Follow the action as it happens with your own computer progress chart, play out the drama of real match encounters, nation versus nation in your own computer football game and capture the spirit of this momentous competition.

and its Latin American setting famous for its carnivals, the passion of its people and the fervour and enthusiasm they demonstrate for their sport.

World Cup Carnival. The ONLY official football supporters' computer game. The ONLY way for a computer enthusiast to follow the World Cup.

Programmed by A.S. Designs

© SPORT-BILLY PRODUCTIONS 1986

POQUE — Official mascot FIBA World Cup 1986

U.S. Gold Ltd., Unit 10 The Parkway Industrial Centre, Heneage Street, Birmingham B7 9LY. Tel : 021-359 8881



Commodore  
Tape 64/128 Disk  
£9.95 £14.95

Spectrum 48K  
Tape £9.95



Amstrad  
Tape £9.95 Disk £14.95

Commodore 16  
Tape £9.95



